July 28, 1947

STEEL

The Magazine of Metalworking and Metalproducing

ESTABLISHED 1882

EDITORIAL INDEX, PAGE 37

HOLDEN SALT BATHS

New! Conveyorized Furnace

Liquid Carburizing-Neutral Hardening

ONE MAN operates one or more units depending on size of parts and production schedule.

CAPACITY: 250 to 1000 lbs. per hour.

DRAINING

Last station individual transfer. Variable from 5 to 30 seconds.

QUENCHING MEDIA

Oil, Brine, or Hot Salt (Marquenching or Austempering)

AUTOMATIC LOADING

feeds parts to first transfer station. Flexible for any type of basket work.

HOLDEN Conveyorized SALT BATH FURNACES

You can do it Better in **HOLDEN BATHS**

Licensed under U. S. Patents 2,299,965 and 2,375,630

write!

NEW BULLETIN S-130

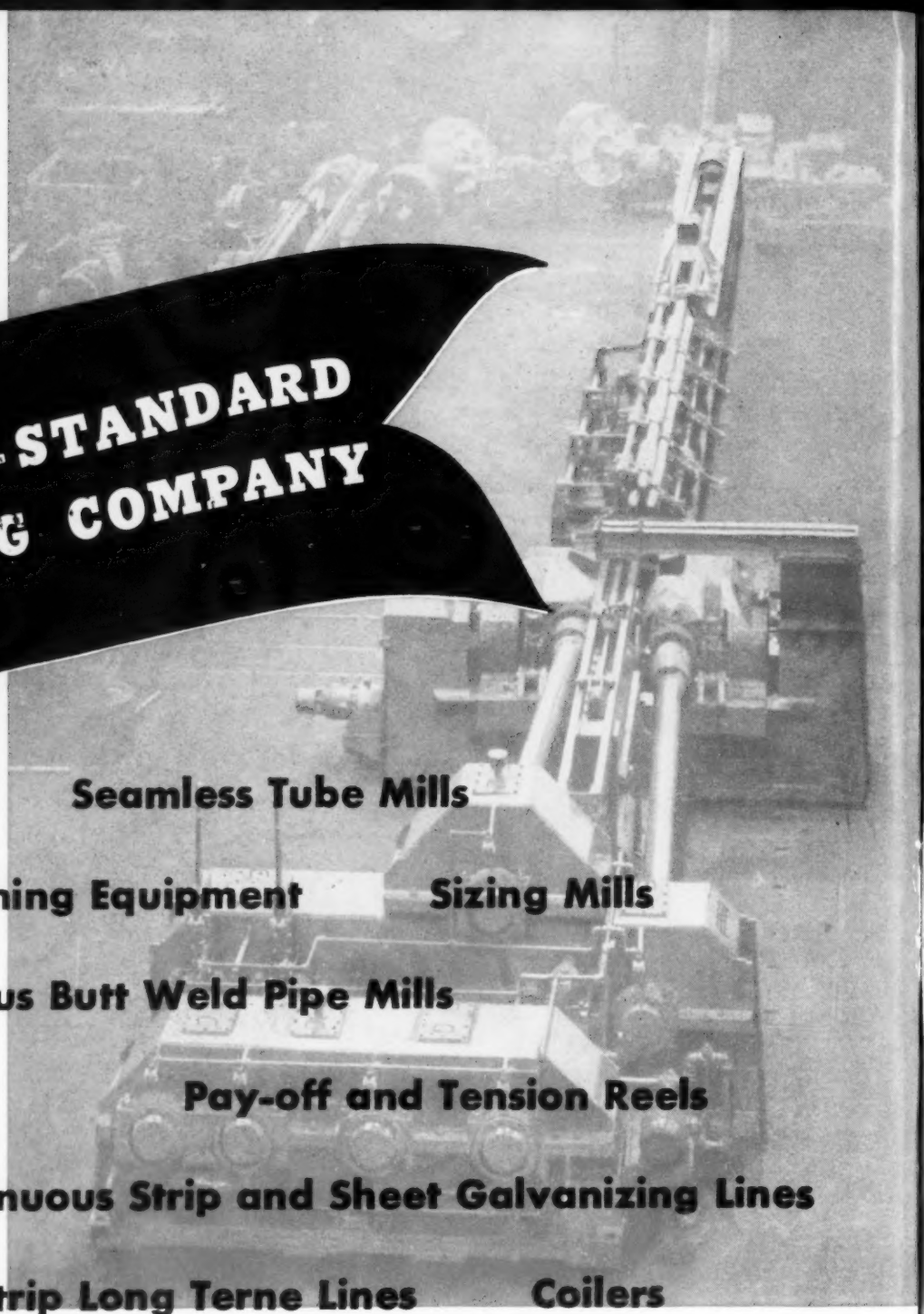
Contains detailed information and tells how this unit reduces labor cost and improves quality.

METAL SHOW CHICAGO Oct. 18-24 BOOTH 550

THE A. F. HOLDEN COMPANY • *Metallurgical Engineers*

Manufacturers Heat Treating Baths and Furnaces • NEW HAVEN 8, CONN.

FOREIGN MANUFACTURERS • Canada: Peacock Brothers, Ltd., Montreal • France: Fours Electriques Rinsche, Paris • Belgium: Le Four Industriel Belge, Antwerp, and other principal countries



THE AETNA-STANDARD ENGINEERING COMPANY

Seamless Tube Mills

Tinning Equipment **Sizing Mills**

Continuous Butt Weld Pipe Mills

Pay-off and Tension Reels

Continuous Strip and Sheet Galvanizing Lines

Continuous Strip Long Terne Lines **Coilers**

Levellers **Mill Tables** **Piercing Mills**

Plug Mills **Rolls**

Slitting Lines

DESIGNERS AND BUILDERS to the Steel, Non-Ferrous and Chemical Industries

THE AETNA-STANDARD ENGINEERING COMPANY

YOUNGSTOWN, OHIO

ASSOCIATED COMPANY: HEAD, WRIGHTSON & COMPANY, LTD., MIDDLESBROUGH, ENGLAND

Rust-resisting coal silos of Mayari R

Mondell Brothers Fuel Supply recently specified Mayari R for six new coal silos to be erected in their Philadelphia storage yard. They selected Mayari R for the high corrosion-resistance it has demonstrated in various coaling station and hopper-car applications.

Controlled atmospheric - corrosion tests show this steel to have 5 to 6 times the rust-resistance of mild carbon steel and 2 to 4 times that of copper-bearing steel of equal gage. This gives an indication of the longer life and greater economy that may be expected from Mayari R.

Mayari R has other properties of equal importance to structural designers. It is a low-alloy, high-tensile steel that can be used in lighter sections to reduce dead-weight, or in equal sections to increase overall strength. It has a minimum tensile strength of 70,000 psi, a minimum yield point of 50,000 psi and an endurance limit of 50,000 psi.

Mayari R is not difficult to fabricate. It can be worked in the same manner and with the same equipment used for ordinary steel.

For more information on the properties and uses of this versatile, weight-saving, rust-resisting steel ask the nearest Bethlehem office for a copy of Mayari R Catalog 209.

Only 2 hrs and 40 min were required to unload and set 6 of these all-welded Mayari R coal silos on their foundations at Mondell Brothers Fuel Supply storage yard, Philadelphia. They are made of 5/16 in. corrosion-resisting Mayari R plate. Inside diameter, 11 ft; height, 30 ft; approximate weight, 16,500 lbs each.

BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation

★ BETHLEHEM STEEL ★

Mayari R *makes it lighter... stronger... longer lasting*

One-Man Operated

AIR CONTROLLED

ORTON

ONE MAN
AERO-CRANE

OPERATED, TRAVELED AND STEERED FROM THE CRANEMAN'S SEAT

- AUTO TRUCK MOBILITY
- ANTI-FRICTION BEARINGS
- AIR-OPERATED CLUTCHES
- SAFETY HOIST BRAKES
- BALANCED WEIGHT
- SIMPLE, POWERFUL DESIGN
- EIGHT MODELS

WITHOUT fatigue, and all day long, *one man*, with an Aero-Crane, does the work of 4 or 5 men—gets your material onto the stockpile and out again at minimum cost. With the Aero-Crane one man handles 200 to 1000 lb. loads that eat up the time of a yard crew.

Designed for rapid yard work, the Aero-Crane goes anywhere a truck can go. You can travel it light or loaded with boom in any position. Tough-built, with anti-friction bearings throughout, electric welded construction, non-burn clutches, Air-controls, Aero-Crane keeps going free of breakdowns—pays for itself in saved man-hours.

Built in a range of eight models. Capacities of 3,500 to 60,000 lbs. at 12 foot radius. Diesel or gasoline powered.

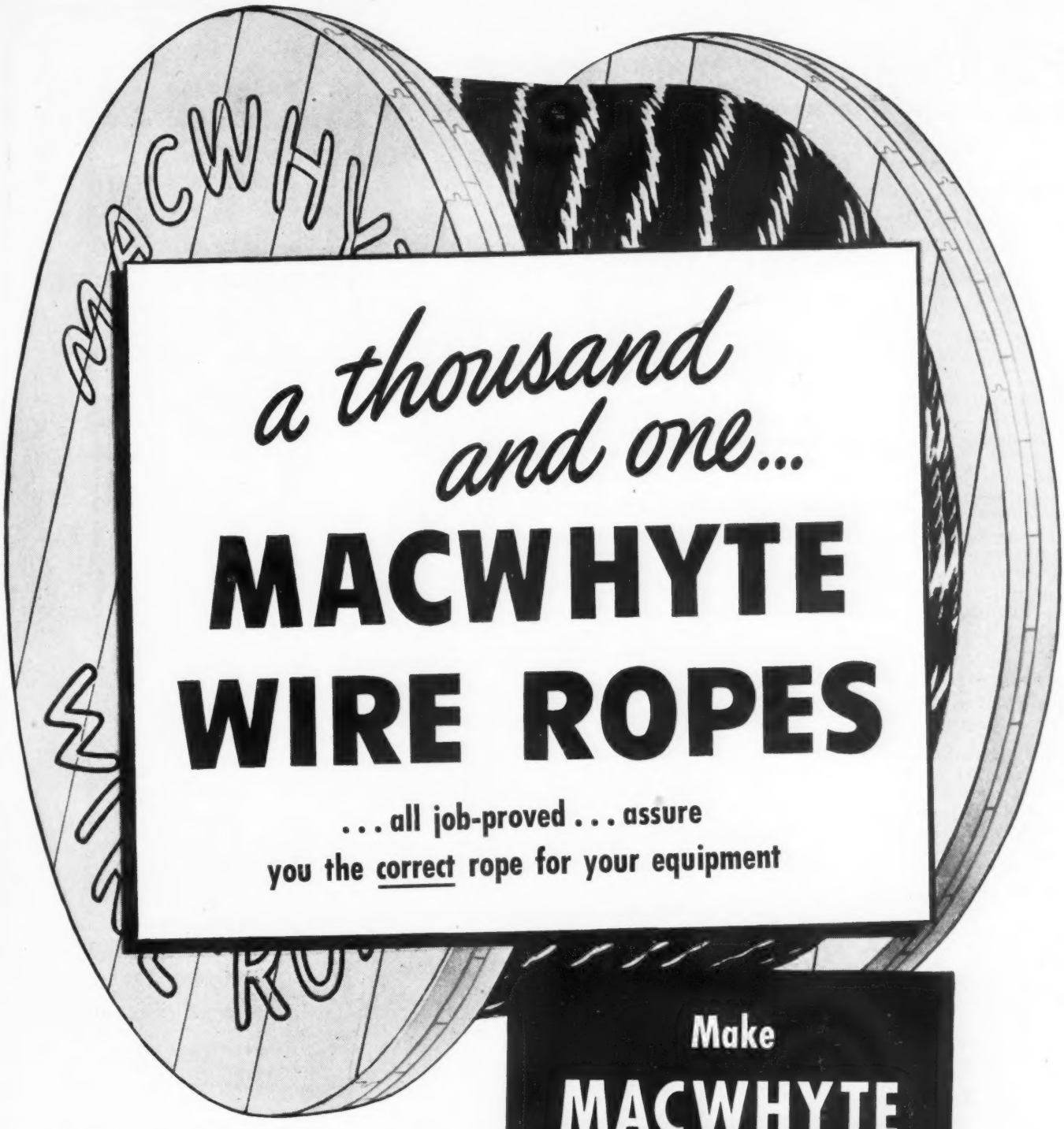
CATALOG 73 GIVES THE DETAILS. SEND FOR IT.

SENSITIZED

POWER

ORTON CRANE & SHOVEL CO.

608 S. DEARBORN ST., CHICAGO 5, ILL.



a thousand and one...

MACWHYTE WIRE ROPES

... all job-proved ... assure you the correct rope for your equipment

When you use the correct wire rope, both the rope and your equipment last longer, cost less to operate. Macwhyte consulting engineers will check your equipment and recommend the wire rope specifically engineered for your job. Ask your Macwhyte distributor, or write Macwhyte Company.

MACWHYTE WIRE ROPE

Manufactured by Macwhyte Company

2912 Fourteenth Avenue, Kenosha, Wis.

Mill Depots: New York · Pittsburgh · Chicago Minneapolis · Fort Worth · Portland · Seattle San Francisco · Los Angeles · Distributors throughout the U. S. A. and other countries

NO. 915

Make MACWHYTE your headquarters for WIRE ROPE and SLINGS

MACWHYTE PREFORMED AND NON-PREFORMED INTERNALLY LUBRICATED WIRE ROPES... MONARCH WHYTE STRAND Wire Rope ... Special Traction Elevator Rope... Stainless Steel Wire Rope ... Monel Metal Wire Rope ... Galvanized Wire Rope. Macwhyte also makes Atlas Braided Wire Rope Slings, Hi-Fatigue Aircraft Cables, Assemblies, Tie-Rods. Catalogs on request.

Behind the Scenes...

New Feature Begins

We forgot to note here the emergence of a new department in this our own weekly journal. Really isn't our fault, it's just that the editors forgot to tell us about it. At any rate, it is a new piece of white space which will be used by you readers who care to take pen in hand and write ye letter to ye editor. The first edition of this letters to the editor feature appeared in the July 21 issue, which was last week, and it will appear upon occasion in the future. If you have a beef or a bouquet, send it to the editor and dare him to print it. He probably will accept the dare! This, we might add, isn't the first time the editors have tried to compete with us in having correspondence with the readers. It has happened in the past, and in fact ran regularly until the war discouraged that sort of thing, so this is a revival rather than a birth. Sort of a renaissance, if you like that sort of language.

Where's That Salt Tablet?

July, according to our local philosopher, is the month of greatest labor troubles. For a while we were a little perplexed about that, but then we realized that all of us have considerable trouble laboring during the kind of weather we have been having of late!

Pertinent Comment

We heard the prize crack of the month the other day. Seems that a timid citizen who lives near our airport has been bothered by low flying planes of a certain airline. Taking his courage in hand, he wrote a terse letter to the directors of that line, as follows:

"Gentlemen: I don't like your altitude. Yours truly."

Add Monkey Wrench

Remember a couple of weeks back we ran an item about a left-handed monkey wrench? Well, we found out that the company who made it, up in Worcester, Mass., is still in business, and in fact this year is celebrating its 117th birthday. From Loring Coes, vice-president of the Loring Coes Co., we learn that his great-grandfather, who was the first Loring Coes, was the inventor of the monkey-wrench as we know it today. The company was founded by Loring and his brother, A. G. Coes, back in 1830, and the family is still operating the company, now in the fourth generation. The fifth generation, according to Mr. Coes, is spread between the Norton Co., and the Moore Drop Forging Co., both of which, we hasten to add, are counted among our family of readers. The Coes company doesn't make monkey wrenches any more, but confines its activity to the production of machine knives. Could be that this sheet was trimmed by one of their knives!

Add Add Monkey Wrench

As a footnote to the monkey-wrench story, we learn from Frank Curran of S. Blickman Inc. that genuine Coes wrenches are still being made, by Billings and Spencer of Hartford, Conn. Somewhere along the line there must have been a switch-over, where a good name was not allowed to die.

The Working Press

Our worthy contemporary and prize-winning house-organ, the Weirton Steel *Employees Bulletin* has come up with a rare photo in its June issue. We were thumbing through the issue, gravely speculating on an excellent story of the new mile-a-minute strip mill down there in the hills of West Virginia, when we stumbled on this gem. It's a shot of an editor at work, one of the few ever captured. He's standing there, pencil and paper in hand, taking notes, and he's none other than Joe Sullivan, our Pittsburgh editor. The story he wrote on that occasion appeared in our June 2 issue, and we suppose the credit for that unusual shot goes to Teddy Varner, the *Bulletin's* photographer.

Gossip Is Back

It may be that things are a long way from normal, with prices soaring and the sky full of flying saucers, but we note increasing signs of normalcy in a lot of places. In Mirrors of Motordom, for example, it sounds good to our ears to be reading once more about what the next year's model cars may look like—bits of trade gossip picked up by Art Allen, our sees-all knows-all Detroit editor. Art has a well-earned reputation for picking up advance tips on the Detroit scene, and that's what has made his weekly stint one of the most widely read business paper features in this country.

Red Face of the Week Dept.

What big elevator manufacturer is unhappy because it can't move into its brand new office building on account of it can't deliver some of its own elevators to itself?

Shrdlu

(Editorial Index—Page 37)

STEEL

Vol. 121—No. 4 July 28, 1947

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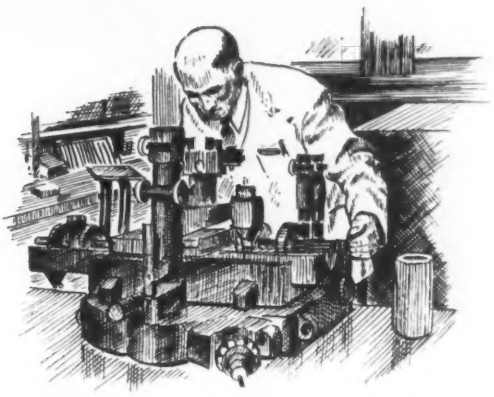
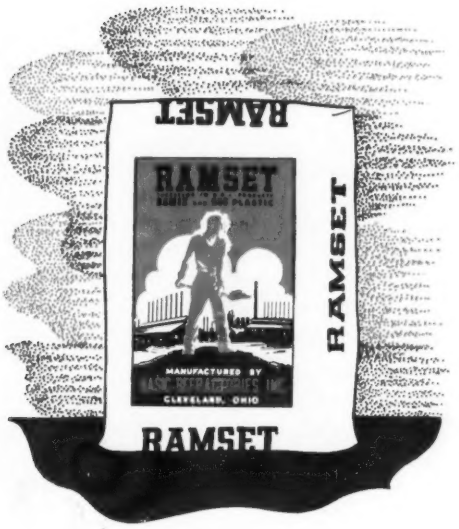
Editorial Staff on Contents Page



IT TAKES A STEEL YARDSTICK

to measure a Basic refractory



RAMSET

Successor to B.R.I. products Ramix and 695 Plastic

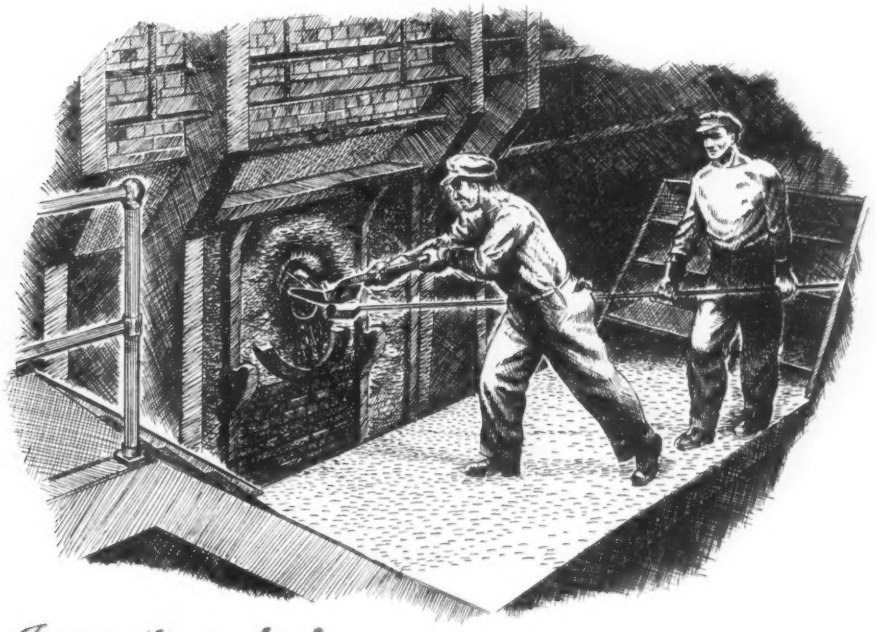
THE chemical composition of a heat of steel does not fully determine the mechanical properties of a bar made from it. You must also know the physical structure of the steel for a sound appraisal.

Similarly, to judge the value of a basic refractory, you should measure the refractory with that same steel yardstick — chemical composition and physical structure.

The amount of magnesia by chemical analysis is only one basis for evaluating a basic refractory. But equally important as a measure of serviceability, is the structure, or mineral form in which the magnesia is present. Of the several mineral forms in which MgO can exist in a refractory, open hearth men are agreed that the most desirable is PERICLASE, or crystalline magnesia.

RAMSET contains approximately 67 percent of magnesia by chemical analysis, *all of which is present as the refractory mineral periclase.*

RAMSET is recommended for new hearth construction, for piping tapholes, and for both hot and cold repairs to open hearth and electric furnace hearths.



Basic Refractories Incorporated **845 HANNA BUILDING, CLEVELAND 15, OHIO**

Exclusive Agents in Canada: REFRACTORIES ENGINEERING AND SUPPLIES, LTD., Hamilton and Montreal

Announcing

A NEW TOOL ROTATING DOUBLE END CHUCKING MACHINE

Fast Index, Power Chucking, Steady High Production

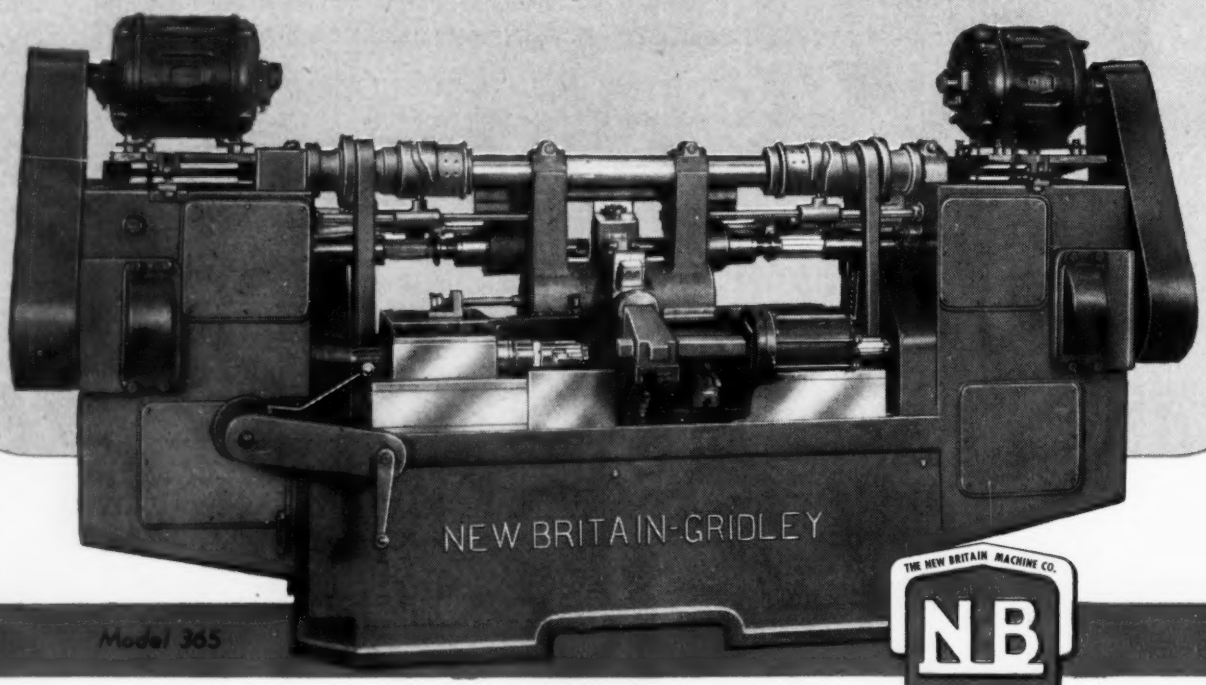
Featuring **1.** A four-chuck horizontal indexing turret with three work spindles on each side. One position for loading. Rough and finish bore, face, drill or ream in the first two positions; finish ream or thread in third position.

2. Over-all weight, power, and rigidity make possible the use of carbide tools and dampen any tendency to vibrate when running at high speeds.

3. Anti-friction spindles mounted in positionable quills carried in slides to minimize overhang. Spindle speeds up to 2,000 RPM have been provided for fast machining of non-ferrous metals.

4. Ease of operation. Loading position is waist high. All controls within easy reach of operator. Automatic chucking quickly accomplished. Many types of pieces may be magazine loaded. Until fully inter-locked safety devices are satisfied, turret will not index nor tools jump.

5. High production. Rapid jump and drawback on all feeds. Total idle time of index - 1.67 seconds. Two pieces may be finished at one chucking on some jobs. Geneva motion index and locking mechanism completely enclosed and guarded against dirt and chips. Either lead screw threading or lead cam threading to take full advantage of self-opening dies or collapsing taps available in No. 3 position. Threading spindles may have different speeds and feeds and will reverse within closest limits on each successive cut.



THE NEW BRITAIN MACHINE CO.
NB

IN THE MIDST OF EVERYTHING AT THE SHOW

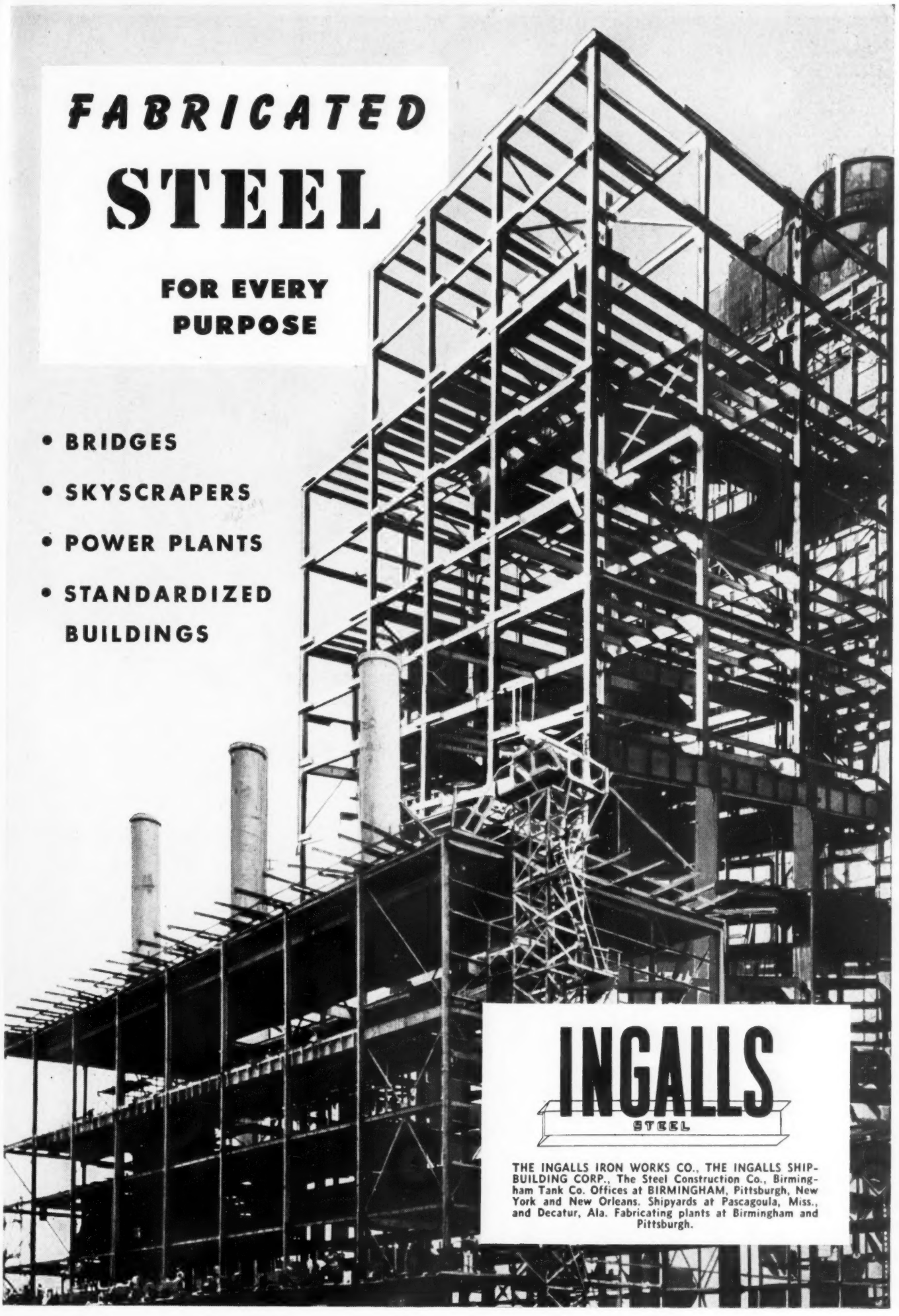
We will have one of these machines in our Booth No. 311 at the Show. We will also have a complete line of six spindle automatic screw machines, four, six and eight spindle chucking machines, a precision contour turning and boring machine, and a new revolutionary turret lathe. We'll be seeing you September 17.

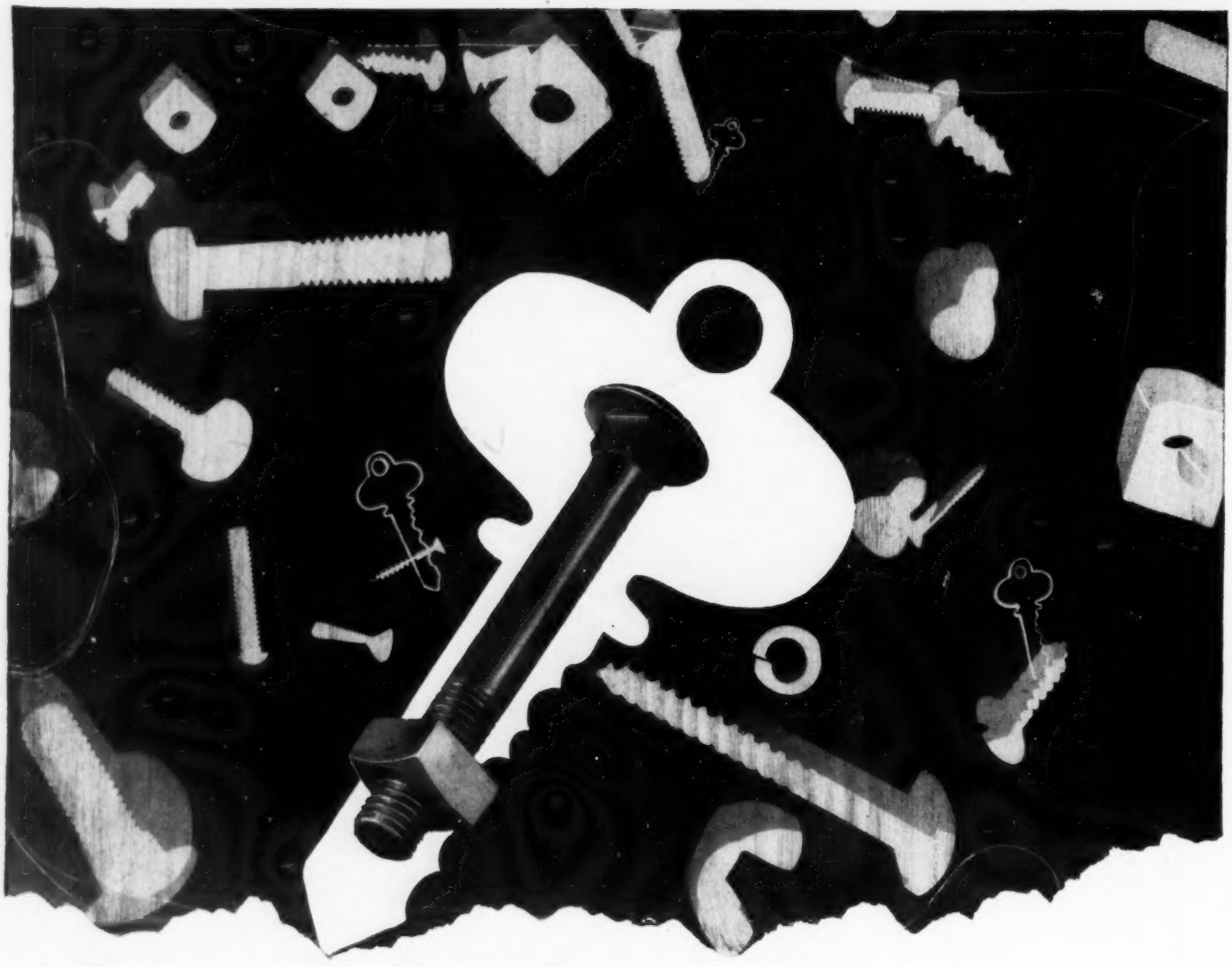
M-01059

NEW BRITAIN

Automatics

THE NEW BRITAIN MACHINE COMPANY
NEW BRITAIN-GRIDLEY MACHINE DIVISION
NEW BRITAIN, CONNECTICUT


FABRICATED
STEEL
FOR EVERY PURPOSE
• BRIDGES
• SKYSCRAPERS
• POWER PLANTS
• STANDARDIZED BUILDINGS
INGALLS
STEEL
THE INGALLS IRON WORKS CO., THE INGALLS SHIPBUILDING CORP., The Steel Construction Co., Birmingham Tank Co. Offices at BIRMINGHAM, Pittsburgh, New York and New Orleans. Shipyards at Pascagoula, Miss., and Decatur, Ala. Fabricating plants at Birmingham and Pittsburgh.



Keys to PRODUCTION

If bolts or nuts, screws or rivets are used in your product, you know how important they can be.

The right kind of metal fastenings – uniform and dependable – can unlock the door to easier assembly, faster production and better appearance. For more than a quarter century, Sterling Bolt Company has supplied industry with exactly the right kinds of bolts, nuts, screws, rivets, washers.

Remember Sterling – it's a reliable name in the metal fastening business, and good metal fastenings are your vital key to better, faster production.

During these times of scarcity, you may find items available in our stocks which would help you through production problems. Inform us of your needs and write for a copy of our current stock list.

Sterling makes a wide variety of metal fastenings, both standard and special. All metals... all finishes... all sizes.

BOLTS
Carriage
Machine
Plow
Step
Elevator
Lag
Stove

NUTS
Square • Hexagon
Cold-punched
Hot-pressed
Semi-finished

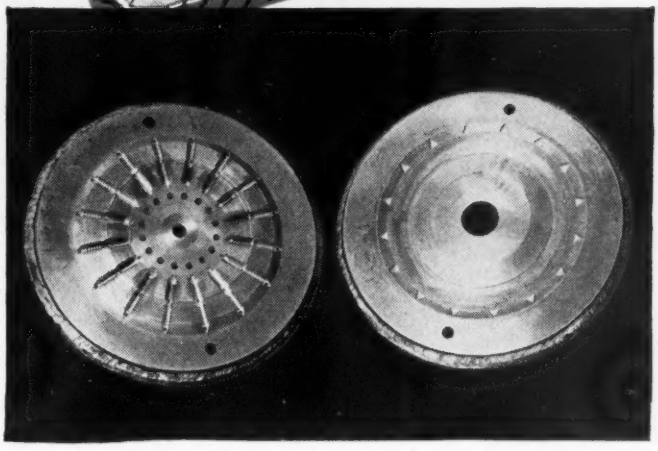
SCREWS
Cap • Set
Machine
Socket Head

STERLING BOLT COMPANY

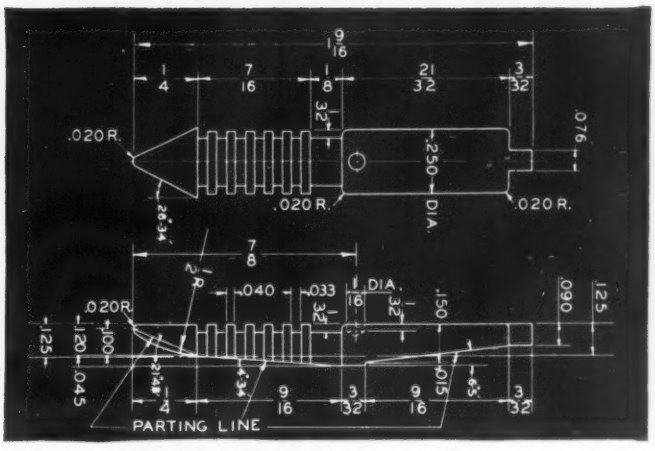
207 W. Jackson Blvd., Chicago 6, Ill. • Harrison 9880

SALES OFFICES: Union Trust Bldg., Cincinnati 2, Ohio; 17 W. Market St., Indianapolis 4, Indiana; 161 W. Wisconsin Ave., Milwaukee 3, Wisconsin; 1228 N. Hadley St., St. Louis 6, Missouri

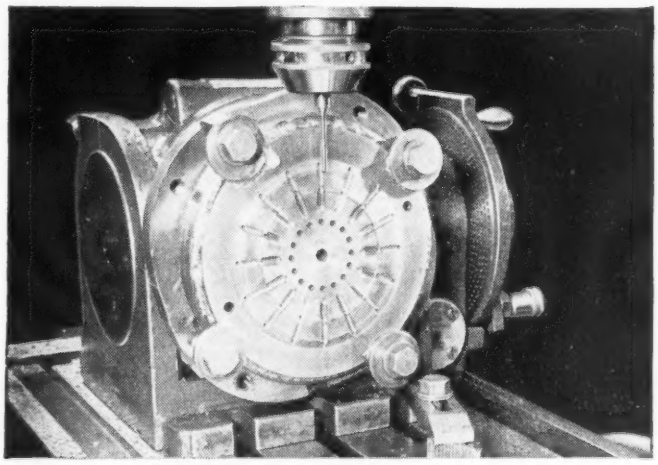
How to Mill an intricate 16-Cavity Injection Mold complete.. *averaging 8¾ hours per cavity!*



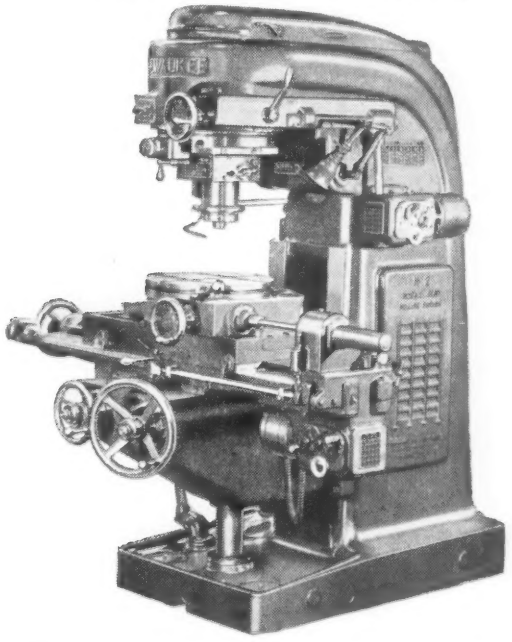
FAST! Both halves of this 16 cavity injection mold for an ink feed part for desk pens milled complete and ejection pin holes spotted in 140 hours! That's typical performance of a Kearney & Trecker — Milwaukee Model 2D Rotary Head Milling Machine on difficult mold making jobs.



DIRECT! These multiple contours were transmitted direct from print to mold block. No fussing with templets or models. One cavity accurately located and each operation successively duplicated after indexing on a dividing head. That's the Rotary head method of "multiple origination."



ACCURATE! Single setup reduced chance for error. Operator relied on built-in precision control and measuring devices for precise end results. Ejector half tipped 90° and special cutter used to square groove corners.



Job Data Courtesy of
Senghusch Self Closing Inkstand Company

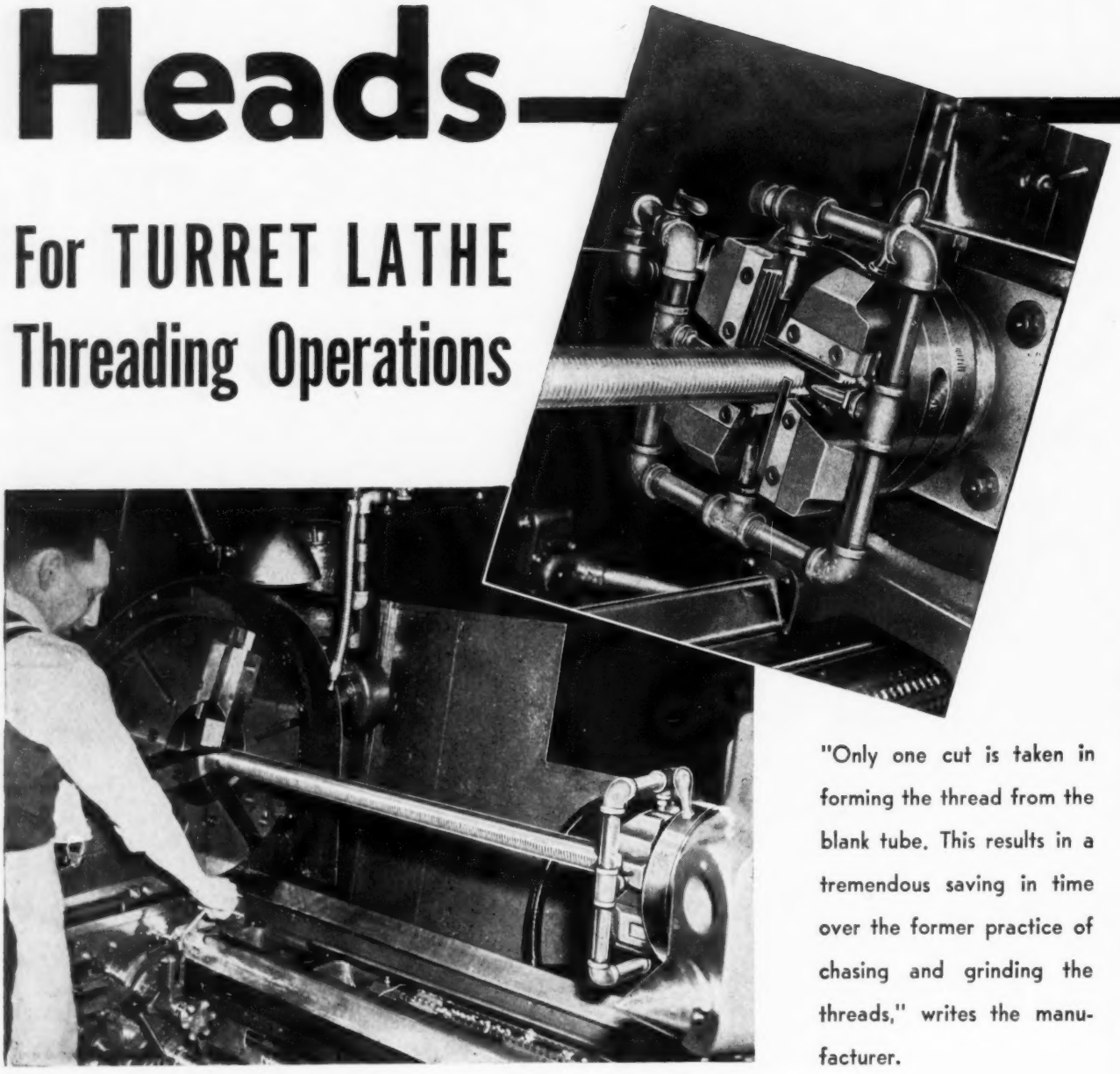
KEARNEY & TRECKER CORPORATION
MILWAUKEE 14, WISCONSIN

4718

For more facts of how you can get Fast, Direct, Accurate results on other mold, tool, die, pattern, toolroom and general production work, using the Rotary Head Method, write for bulletin 1002C on the Model 2D Rotary Head Milling Machine.

LANDMATIC Heads—

For TURRET LATHE Threading Operations



Illustrations show a 3" LANDMATIC Die Head used by a Western aircraft company to thread long Wing-Flap Retracting Screws to extremely close tolerances. An Acme thread of 2" diameter, 4 threads per inch, is being cut to a length of 45½" on heat treated alloy steel tube 48" in length.

Thread lead and pitch diameter are held within aircraft tolerances. Concentricity of thread with the O.D. of tubing and smooth finish is assured by the use of Landis tangential type centering throat and roughing and finishing form chasers. Centering throat section of the chasers takes a bearing on the O.D. of the tubing, eliminating an out of round condition that often exists when long work pieces are being threaded.

"Only one cut is taken in forming the thread from the blank tube. This results in a tremendous saving in time over the former practice of chasing and grinding the threads," writes the manufacturer.

Write for Bulletins F-80 & F-90

1947 Machine Tool Show — Chicago — Sept 17-26

LANDIS MACHINE COMPANY

WAYNESBORO, PENNA., U.S.A.

PROTECTION

Visit HY-TEST
Stevens Hotel, Booth 97
National Safety Congress and Exposition
Chicago, October 6-10

WHERE NEEDED

H702—Men's Black Kangaroo Blucher, Leather Sole, half Rubber Heel. **Delivery at once.**

Insure Workers Feet In Sure Protection

ANCHOR FLANGE STEEL BOX TOE with HY-TEST *Safety Shoes*

This flange adds extra strength to the steel arch's sidewall. Anchored between insole and outsole, it also serves to resist shifting, tilting and cutting through outsole under impact.

Knights of production lines use modern armor — Hy-Test's Anchor-Flange Steel Box Toes. This armor of steel is built into sturdy leathers to ward off blows that injure toes. And Hy-Test Safety Shoes are a pleasure to wear. They have the new Slant-eze tops and many other comfort features. They're all leather in vital parts . . . strongly built and styled along neat dressy lines. Sizes are 5 to 15 in widths AA to EEE. It's easy for your workers to have them. Let us tell you how.

HY-TEST SAFETY SHOES

HY-TEST *Safety Shoes* THE WORLD'S LARGEST SELLING SAFETY SHOE

HY-TEST DIVISION • INTERNATIONAL SHOE COMPANY • ST. LOUIS 3, MO. • EASTERN OFFICE • MANCHESTER, N. H.

HAVE YOU HEARD?

Have you heard the reasons why so many people are going to the Machine Tool Show, at the Dodge-Chicago Plant from September 17th to the 26th?

More than 100,000 management, production, engineering, purchasing and financial executives will attend this first Machine Tool Show to be held in twelve years.

It's the World's Greatest Metalworking Show. It's being held in the largest manufacturing plant, under one roof, in the world.

There will be nightly sessions at which papers, covering the latest developments in metalworking techniques and processes, will be presented by world-renowned authorities.

Don't miss this opportunity to see 12 acres of cost-reducing equipment of the future—in full operation.

Send in your advance registration now. You'll avoid delay at the registration desk. If you don't have an advance registration form, write for one today.

National Machine Tool Builders' Association,
10525 Carnegie Avenue, Cleveland 6, Ohio.

MORE GOODS FOR MORE PEOPLE
AT LOWER COST

MACHINE TOOL SHOW

SEPT. 17-26 DODGE-CHICAGO PLANT—CHICAGO, ILL.

MORE GOODS • FOR MORE PEOPLE • AT LOWER COST

It Says "Giddap" to 2500 Horses . . .

THIS gear is used in an inertia starter. It has to kick over a heavy aircraft engine until the pistons go to work. For this grueling application, alloy steel is a must.

Note the machining required. Then multiply it by a production quantity. As with every production application, machinability becomes a must, too.

That's why Frasse stocks 11 medium-carbon alloy steels in only one condition—*annealed.* You've alloy properties galore to choose from when you work from Frasse stocks. But no matter what the analysis, it has been treated for faster, easier machinability, and for uniform structure.

There's no fear of non-uniformity when you use Frasse alloys. You get the same machinable structure with every order. Standardize, for warehouse alloy steels, on Peter A. Frasse and Co., Inc., 17 Grand Street, New York 13, N. Y. (Walker 5-2200) • 3911 Wissahickon Avenue, Philadelphia 29, Pa. (Radcliff 5-7100) • 50 Exchange Street, Buffalo 3, N.Y. (Washington 2000) • Jersey City • Syracuse • Hartford Rochester • Baltimore

FRASSE

for Alloy Steels

A 3135	X 4340	A 6150
A 3140	A 4615	A 8620
X 4130	A 6145	A 8740
A 4150		A 8742

GET THIS HANDY ALLOY CHECK CHART

New Frasse check chart lists heat treat procedures for 60 popular alloy steels. Includes temperatures for hardening, annealing, normalizing, carburizing. Also covers cooling media and tempering ranges. Send the coupon for your free copy today.

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Please send me a free copy of your alloy heat treatment check chart, Section D, No. 3.

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because in this case it means strong, easy-to-assemble Republic UPSON Quality headed and threaded items. Throughout more than 20,000 different sizes and shapes, Top Quality—backed by 93 years of bolt-making experience—is the *only* quality in Republic UPSON Quality Products.

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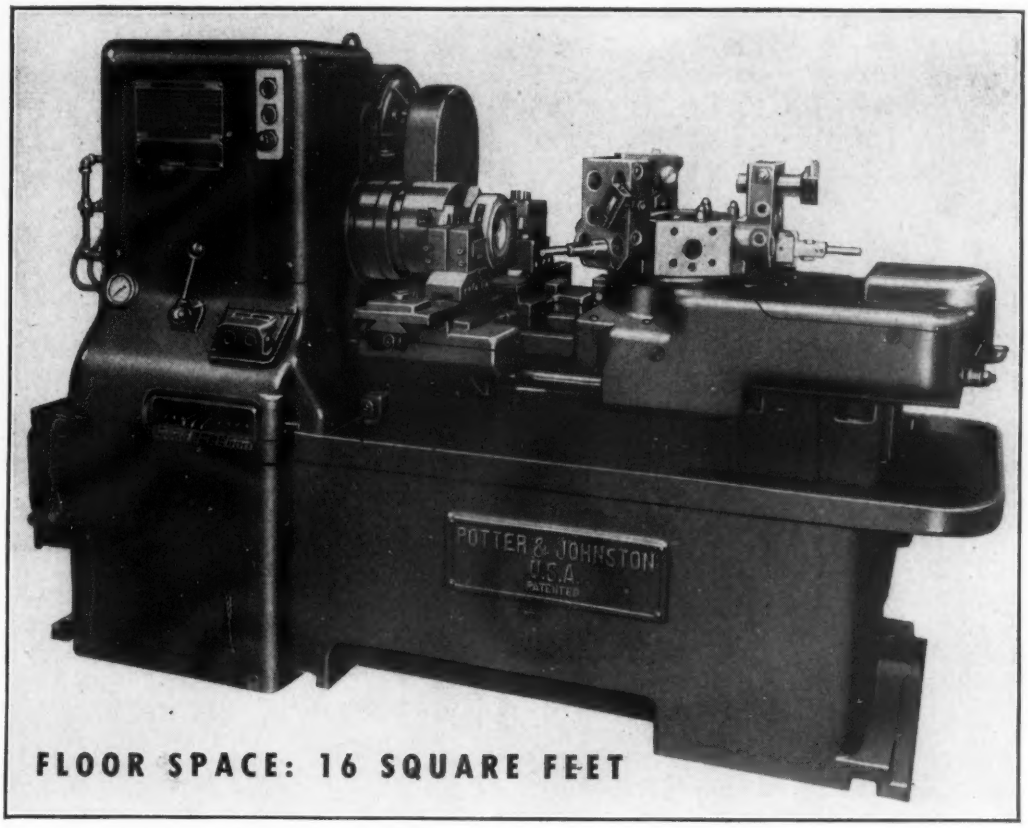
REPUBLIC STEEL

Other Republic Products include Pipe, Sheets, Tubing, Hot Rolled and Cold Drawn Bars—Carbon, Alloy and Enduro Stainless Steels



FLOOR SPACE: 16 SQUARE FEET

Versatility of Tooling

The Potter & Johnston new 3-U Speed-Flex Automatic Turret Lathe, with its power and high speed demanded by carbide tooling, is characterized by the versatility of its tooling. It can be set up to perform a single operation, or multiple operations simultaneously. *The machine makes a complete cycle of operations in 24 seconds!* It has 48 changes of speed arranged in six sets of four automatic changes; Lowest 36 R. P. M., Highest 1445 R. P. M. It has 24 feeds arranged in geometric progression from .0023 to .0684, or from .0042 to .125 per spindle revolution. All the innovations and improvements built into the new 3-U are designed to improve the quality of the production, and at the same time cut the cost per piece. In the final analysis, this is the main function of the machine—and if you are about to select machines for your production line, we respectfully suggest that you consider the advantages offered by this latest P. & J. development, the 3-U Speed-Flex Automatic.

P. & J. Automatics will be Demonstrated in Action
Booth 43—Machine Tool Show—Chicago
Sept. 17-26

P&J

POTTER & JOHNSTON MACHINE CO., PAWTUCKET, R.I.

BOTTOM TROUBLES:

Junior's little bottom has snagged upon a fence,
so Grandma's fancy patchwork restores his elegance.
But when a *furnace* bottom does *not* burn through,
the chances are it's MAGDOLITE to which the credit's due.

Years ago Baker's MAGDOLITE began warring on Open Hearth bottom troubles and has been waging a full-scale offensive ever since. The tide of battle has become so favorable that more and more steel companies have joined the ranks of MAGDOLITE users in an all-out drive to lick holes, the greatest enemy of Open Hearth and Electric furnaces. Enlistment is still open . . . join MAGDOLITE'S ranks now for less "out" time—greater profits!

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COMPOSITION
QUALITY
STRENGTH
PREPARATION
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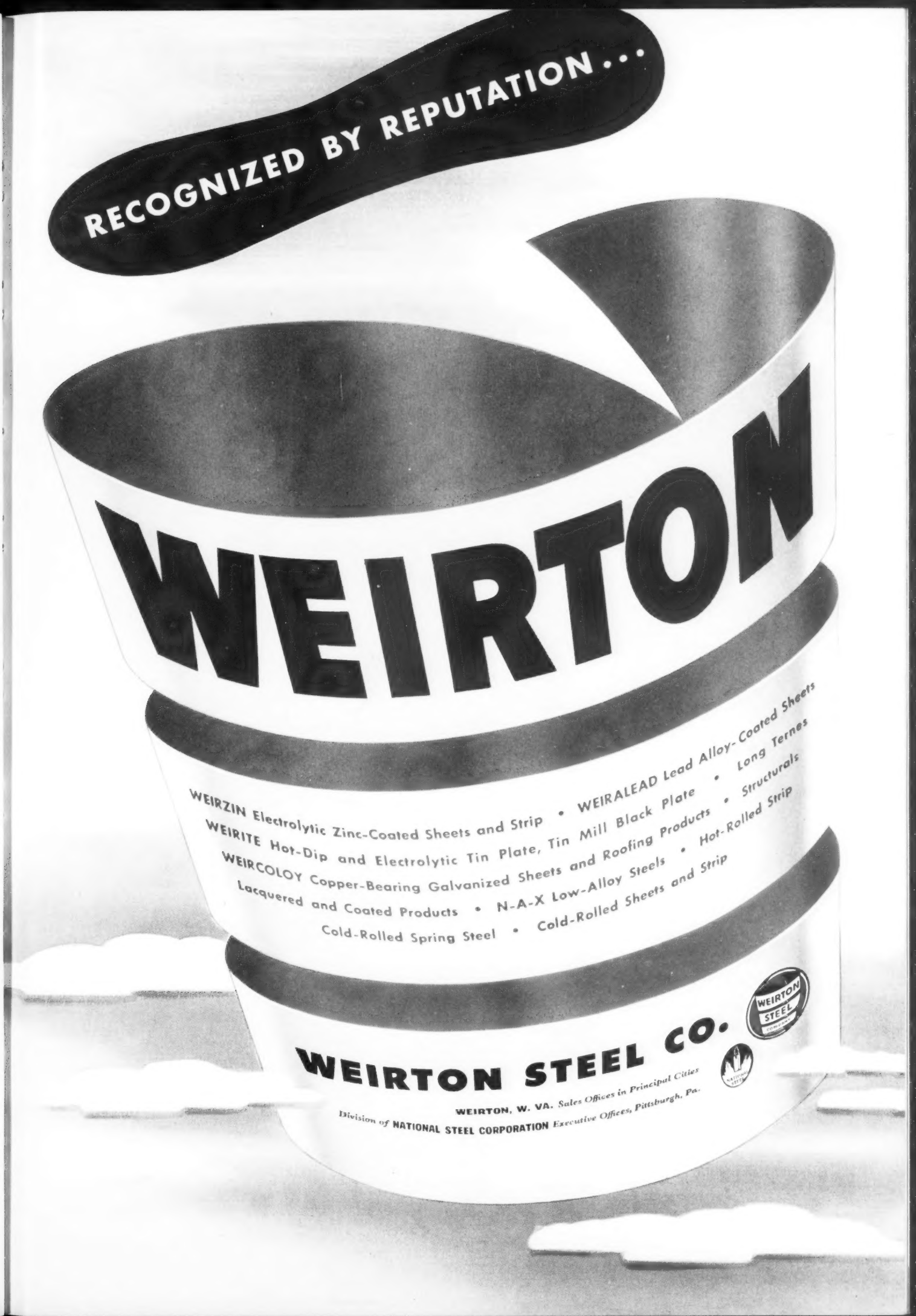
You're always SAFE with BAKER'S MAGDOLITE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New factor in management's big job of lowering production costs

SELAS CORPORATION'S *Gradiation* PROCESS

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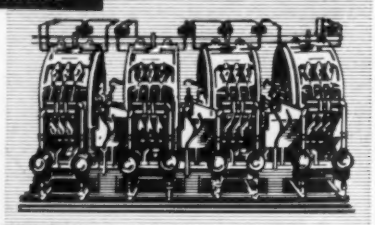
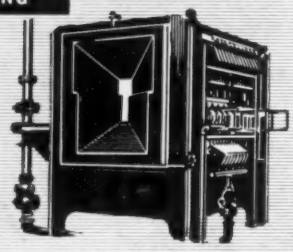
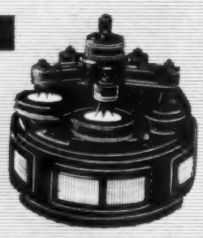


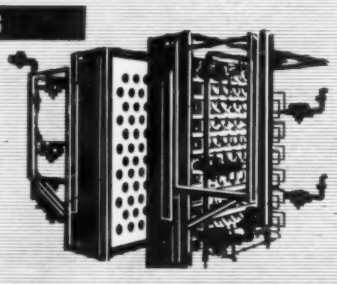
HEATING FOR FORGING



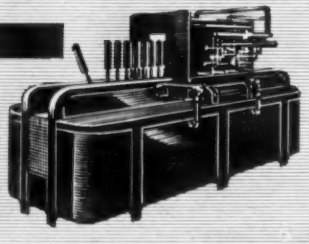
SELECTIVE HARDENING



STRIP HEATING



BRAZING



— provides metal industry new standards for heat-processing results

— distinguishes new techniques and equipment from traditional gas-heating methods

GRADIATION changes the ability of commercial gas fuels to serve industry. For speed, product improvement, exact reproduction of heating effects, automatic handling of work and ease of control, industry has new aid. Integration of heat-processes with plant operations is improved and, as direct result, substantial benefits in operating costs accrue.

Results are actual and can be measured. Engineers of Selas Corporation developed GRADIATION and then put it in use in plants and mills whose work with metals represents a cross-section of heating requirements. Installations and their results are the credentials with which GRADIATION—a distinct, new method—comes before industry.

Technically, the name GRADIATION implies *radiation*—high speed, high temperature, solar-like heat; it implies *gradient*—faster heating by exposing materials to superheat with precise control of heating rate; it implies *gas-radiation*—which protects the charge and is economical to apply.

Data from installations of the GRADIATION method are available to metal producing and metal working industries and to gas companies through Selas representatives or from Selas headquarters.

SELAS CORPORATION OF AMERICA PHILA 34 PA

GRADIATION IS A SELAS TRADE NAME

CONSULTING AND MANUFACTURING GAS ENGINEERS

Check These Advantages of CLEVELAND HIGH SPEED COUNTERBORES AND SPOT FACERS

RIGID AND STRONG

The counterbore and spot facer being integral with the shank and the shank being a standard taper, permits the tool to be used directly in the machine spindle, eliminating all holders and adapters.

SIMPLE IN DESIGN

Made of the best grade of High Speed Steel, with no unnecessary or easily mislaid parts.

EXTRA LONG FLUTES

The flutes are extra long, which gives extended life for regrinding and permits the counterboring and spot facing of parts which cannot be reached with a short tool.

TOOL STEEL PILOTS

Pilots are made of the best grade of Carbon Tool Steel, properly heat-treated and ground. They are simple in design, having a straight shank with a flat for the set screw.

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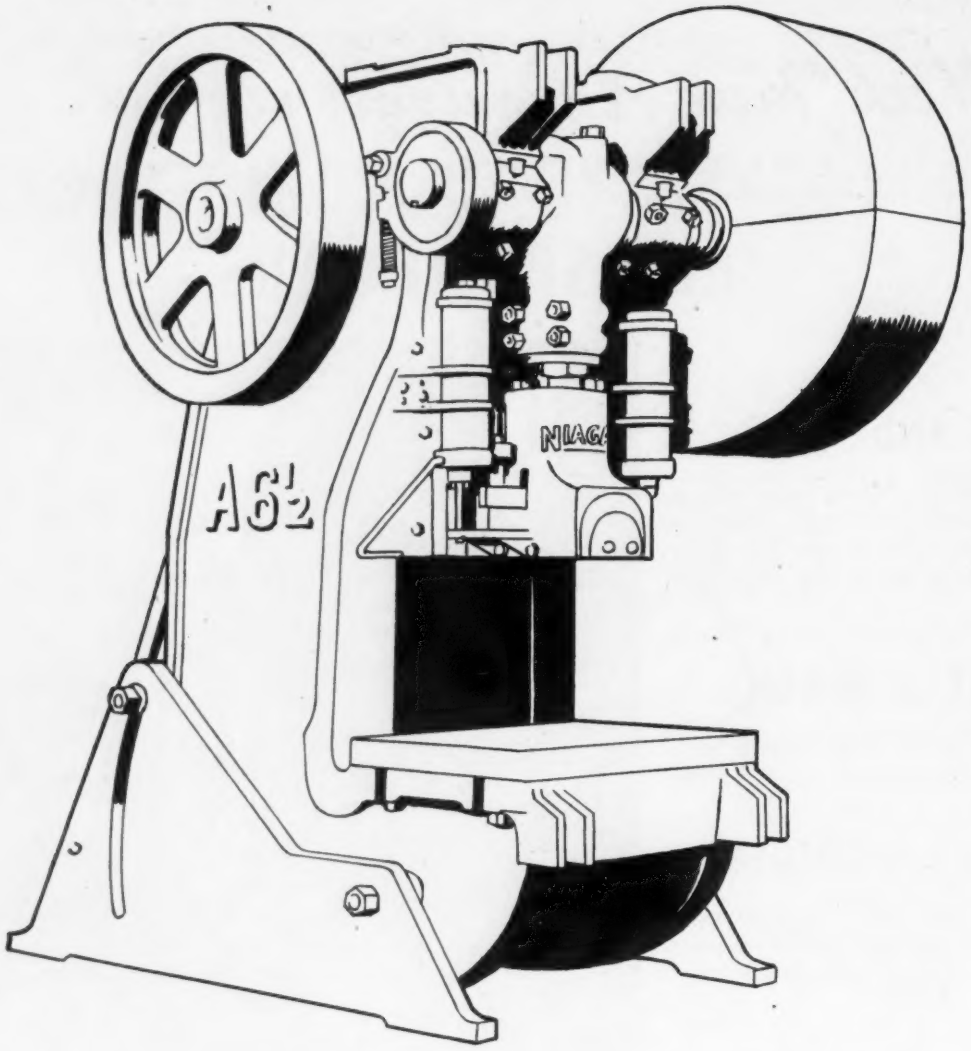

Great Names in America's Progress

Paul Revere

PAUL REVERE wrote a dramatic chapter in American history with his famous ride in 1775. Likewise, his talent and skill in working with copper were the foundation of many industrial achievements which have improved American living. A host of modern things are made of copper, and Niagara presses and shears help make them. It is easy to take copper for granted, but today you can't take high production costs for granted. Investigate how the advanced design of latest type Niagara presses and shears effects economies per man, per hour, per piece, per dollar.

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Try the heft of a spirit level or a hacksaw frame or a notary seal that's made of an Alcoa Aluminum Forging. Light, isn't it? Strong, too, to take the blows and impact of everyday hard use. That's the kind of hand tools that workmen go for . . . light to carry, strong to last.

Whatever you are making— hand tools or machine parts, household or heavy-duty equipment—you should know more about Alcoa Aluminum Forgings. They have strengths up to 82,000 psi. ultimate, elongations as high as 15%, and cost less than you'd think.

We'll be happy to help you with the economics and the design of parts as Alcoa Aluminum Forgings. ALUMINUM COMPANY OF AMERICA, 2112 Gulf Bldg., Pittsburgh 19, Pa. Sales offices in leading cities.

MORE people want MORE aluminum for MORE uses than ever

ALCOA FIRST IN ALUMINUM

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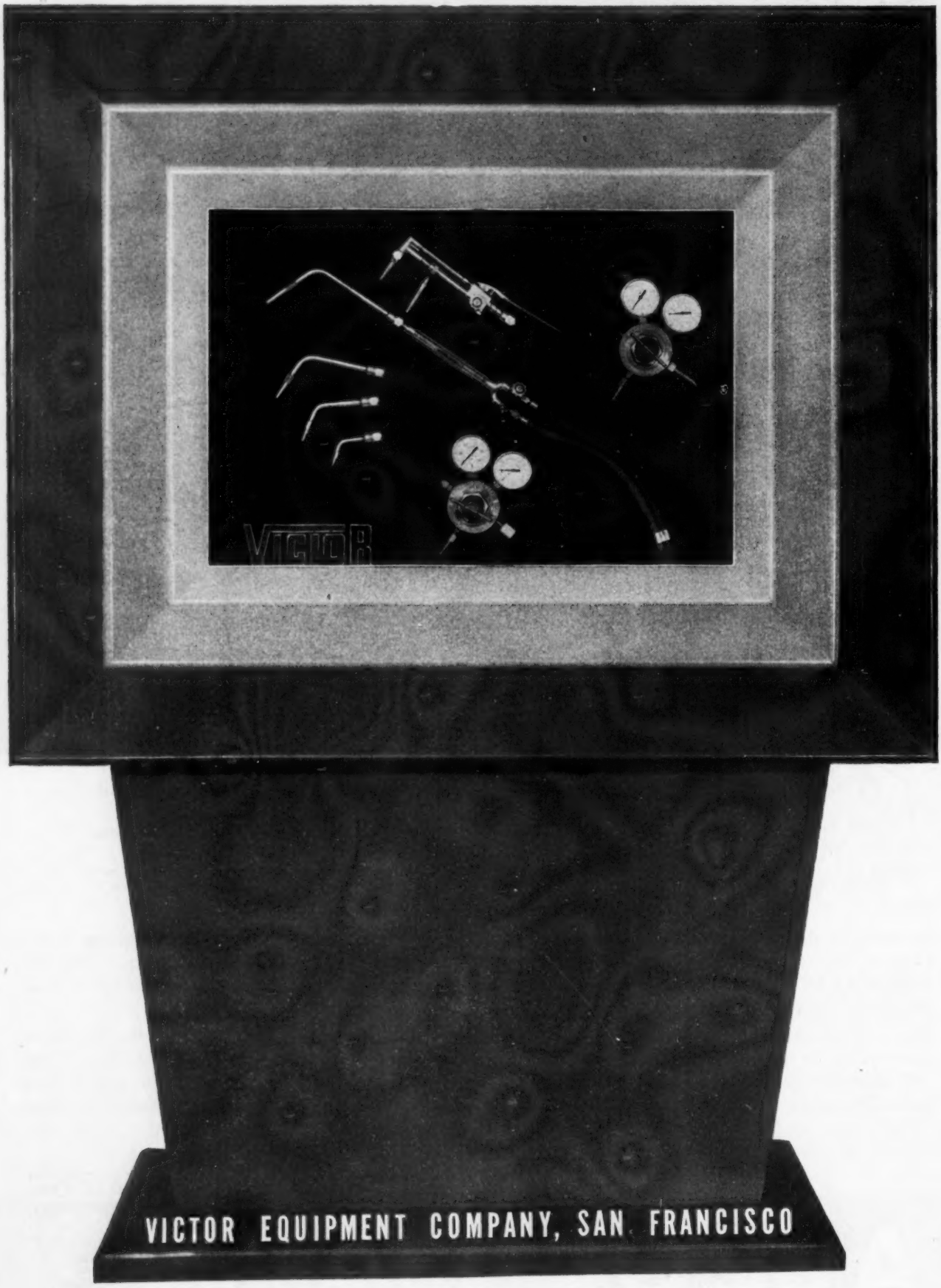
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Proper balance between accuracy of finish and rate of stock removal . . . between fast cutting action and long wheel life . . . plus better balance in the grinding wheel itself . . . these features of Simonds Abrasive Wheels combine to give exceptional results.

Write for copy of our technical manual "Modern Centerless Grinding Practice" for further details. Consult your Simonds Abrasive Distributor for the best grinding wheels for your jobs.

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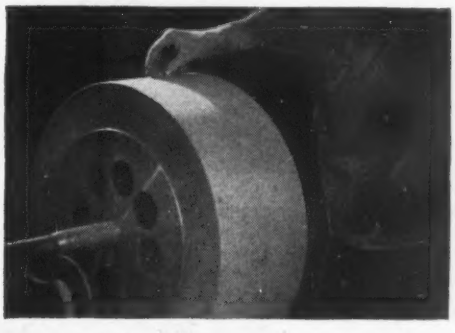
Each Simonds Abrasive Wheel is carefully checked and tested for balance at the factory.



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For Money In Your Pocket
PERFORMANCE . .

Resists Kinking

Being free from internal stress, it is always easy to handle—never fights back.

Spools Better

Even with a light load, it spools uniformly—is never cranky.

Takes Reverse Bends

Takes this "fatigue" much better, as on rope-ruining elevator installations.

Safer to Handle

Worn union-formed ropes handle as safely as new, as broken outer wires lie close to rope.

Always Relaxed

While it is flexible, and pliant, it has the "toughness" to withstand strain and weight.

Behaves on Grooves

Resists rotating or twisting in sheave grooves because wires are Preformed.

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union-formed

(preformed)

THE ULTIMATE IN LOW COST WIRE ROPE

Precision Constructed to OUTPERFORM *ordinary Wire Rope*

FIGHT! FIGHT! There is an exhausting fight going on all the time in ordinary wire rope. Each wire is fighting constantly to get out of the fixed position into which it is forced without any preliminary training to put it in shape. This internal fighting spoils the performance, cuts it short, doesn't give you a run for your money.

In **union-formed** Wire Rope each wire is put in shape (*Pre*formed) before it ever touches another wire in the rope. The result is exactly the same that comes from a set of conditioned muscles, i. e. finer coordination, greater endurance, top-flight kind of performance that does not let you feel out-of-pocket.

Yes sir! You will always get the most out of the best. The little extra you invest for the best is the part of your investment which will bring the pay-off — yield the most dividends. Prove this fact to your own satisfaction. *Specify* **union-formed** — get money-in-your-pocket performance.

union *Wire Rope*

UNION WIRE ROPE CORPORATION

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Tulsa 3 Houston 11 Chicago 6 Salt Lake City 13 New Orleans 16

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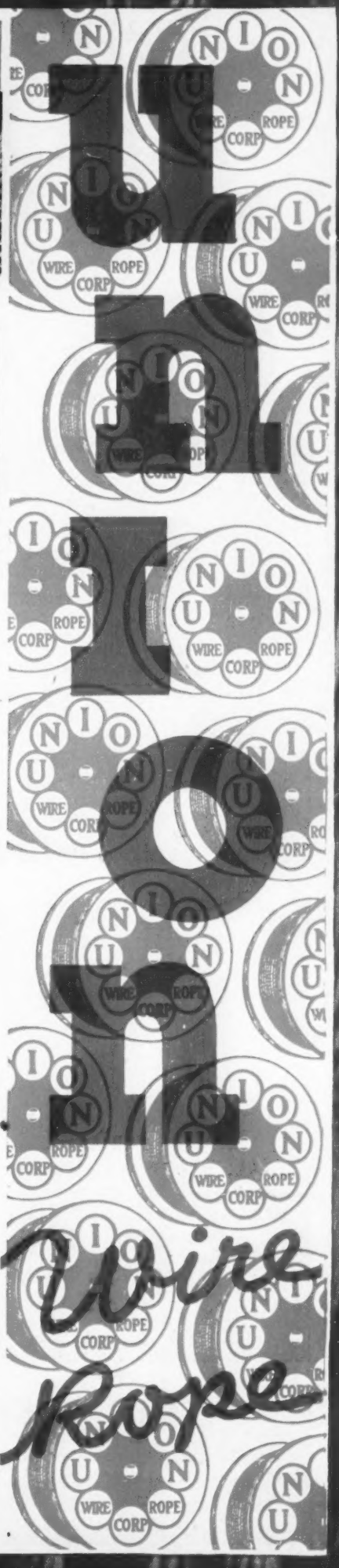

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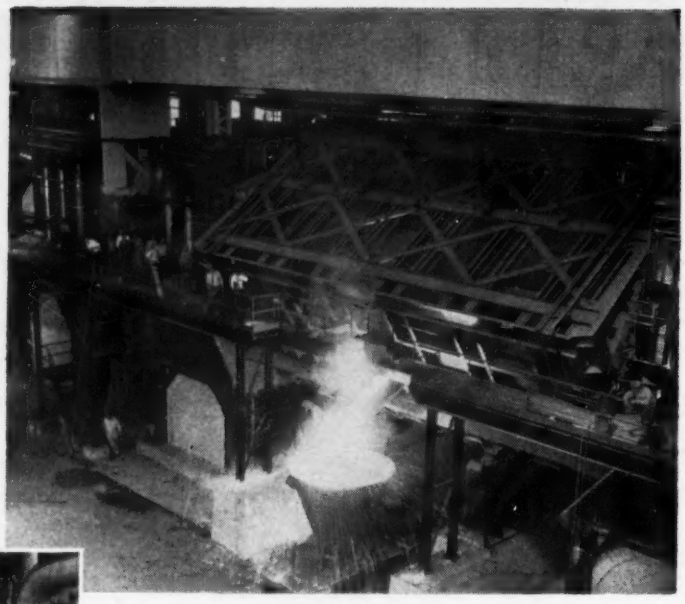

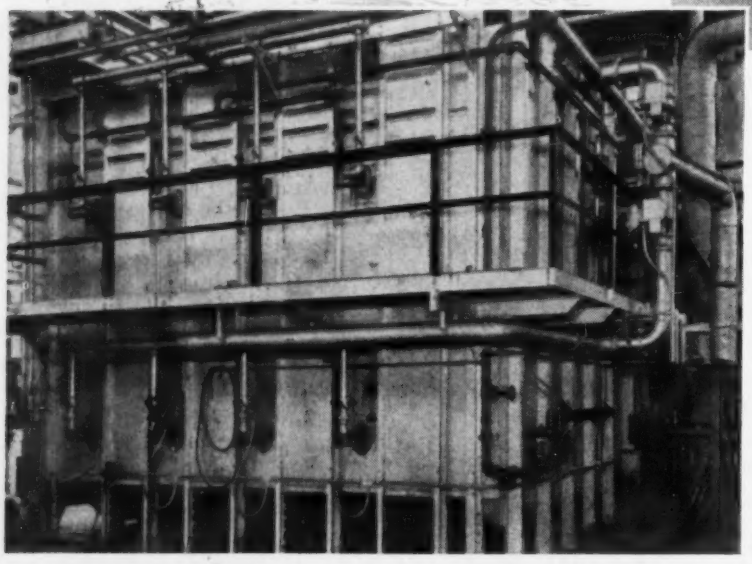

FOR EVERY JOB in the Steel Mill

Pictured on this page are three of the many and varied types of industrial furnaces designed, engineered and constructed by the Loftus Engineering Corporation.

Loftus is fully equipped to handle any furnace construction problem that you may have—however difficult or exacting.

All Loftus furnaces are tailor-made to meet individual requirements. Their sound design and rugged construction insure higher efficiency at lower operating costs.

Inquiries are invited for all types of Industrial Furnaces, Melting and Heating Furnaces and related equipment for the Steel, Foundry, Aluminum and Brass Industries.

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Designers and Builders Engineers, Consultants, Contractors

He writes only in RED INK!

INADEQUATE WIRING, the industrial jinx, embezzles millions every year. It would take quarts of red ink to record the toll he takes in unproductive wages, lost production and spoilage.

For, when he attacks, through overloaded, over-extended, obsolete wiring, efficiency can drop from 25 to 50 percent.

To shut out this costly scribe, talk to your plant power engineer, consulting engineer, electrical contractor or power salesman.* They can write him off... before he gets into your books.

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*WIRE AHEAD, a new booklet discussing preventive maintenance ... the symptoms of inadequate wiring ... and presenting plans for anticipating electrical demand, is now available on request. Address Advertising Department, 25 Broadway, New York 4, N.Y.

ANACONDA
from mine to consumer

ANACONDA WIRE & CABLE COMPANY

This $500,000 picture needs $4,745 more . . . Do you see WHAT'S MISSING?

These floating derricks valued at $500,000 can't operate without the wire rope which is missing in the picture. It costs about $4,745 to equip the derricks with Preformed Wire Rope made of Improved Plow Steel. That's only $790 more than ordinary wire rope—and Preformed is far more economical.

When you buy any machine rigged with wire rope, make sure it comes equipped with Preformed. More and more manufacturers are standardizing on Preformed for their original equipment because it improves performance of their products. It's a money-saver because it lasts longer. It's easier and safer to handle.

Write for Free Copy of helpful book about Preformed. Address the Preformed Wire Rope Information Bureau, 520 N. Michigan Avenue, Chicago 11, Illinois.

Ask your own wire rope manufacturer or distributor

PREFORMED WIRE ROPE

LASTS LONGER
HANDLES EASIER

ALWAYS LOOKING INTO THE FUTURE

Injecting oxygen into the molten steel bath

another Airco first

Today, steel making in the Open Hearth stands on the threshold of far reaching developments thanks to the cooperation of leading steel mills with Airco research.

The basis of this research is Airco's development of a practical method of injecting oxygen directly into the molten steel bath through the slag cover.

This opens up new avenues of approach in controlling, and in materially reducing the refining period.

Yes, tomorrow's steel will be produced faster due to this important use for oxygen . . . as developed by Airco technicians.

This promising new technique, which is exciting the imagination of steel makers, is another outstanding example of Airco's continuing effort to provide time-saving, product-improving tools and processes for ALL industry. The facilities of our Technical Sales Division are available to you in applying Airco techniques and products to the solution of your problem.

If you desire further information about this process, please direct your request for a copy of our bulletin, "Use of Oxygen In The Open-Hearth Bath", to Dept. 5650, Air Reduction, 60 East 42nd St., New York 17, N. Y. In Texas: Magnolia Airco Gas Products Company, Houston 1, Texas.

AIRCO **AIR REDUCTION**

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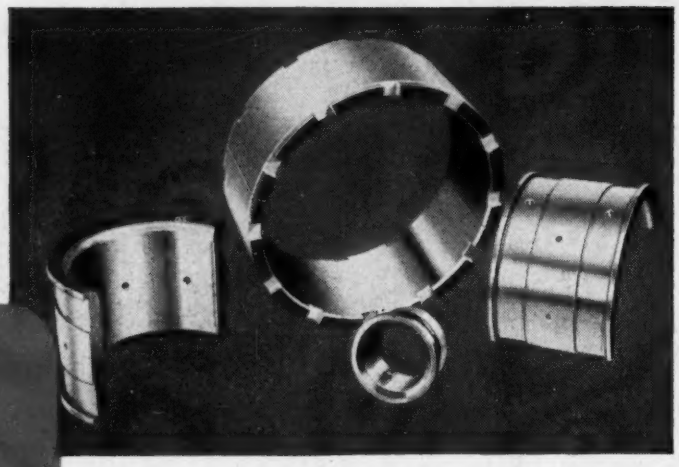
Originators of Modern Oxyacetylene Flame and Electric Arc Methods For ALL Industry

SHORT CUTS TO BETTER PARTS



MECHANICAL TUBING *seamless and welded* FOR ANY APPLICATION

Hollow structural assemblies and precision working parts made from B&W Mechanical Tubing give *lightweight* construction with *heavyweight* ruggedness and dependability—show important savings in production time, costs and materials over the use of forgings and bar stocks.

From its modern specialty tube mills, B&W can supply mechanical tubing—either seamless or welded—of the proper analysis, size, gauge, temper and finish for making practically any hollow machined or fabricated part . . . better, faster, cheaper. In fact B&W Mechanical Tubing embraces the widest range of analyses available from one source. So no matter what kind of steel tubing you need—from plain carbon to high alloy grades—B&W makes it.

You'll find a lot of present uses of B&W Mechanical Tubing that may suggest future savings for you in Bulletin TDC-123. Send for a copy today.

TA-1409 M

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GENERAL OFFICES: BEAVER FALLS, PA.
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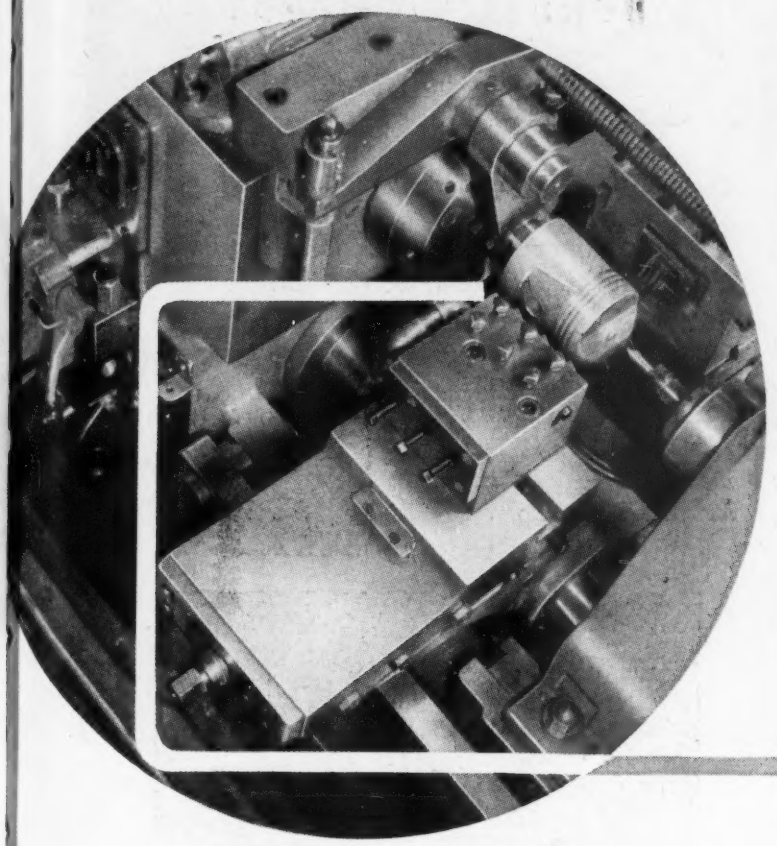
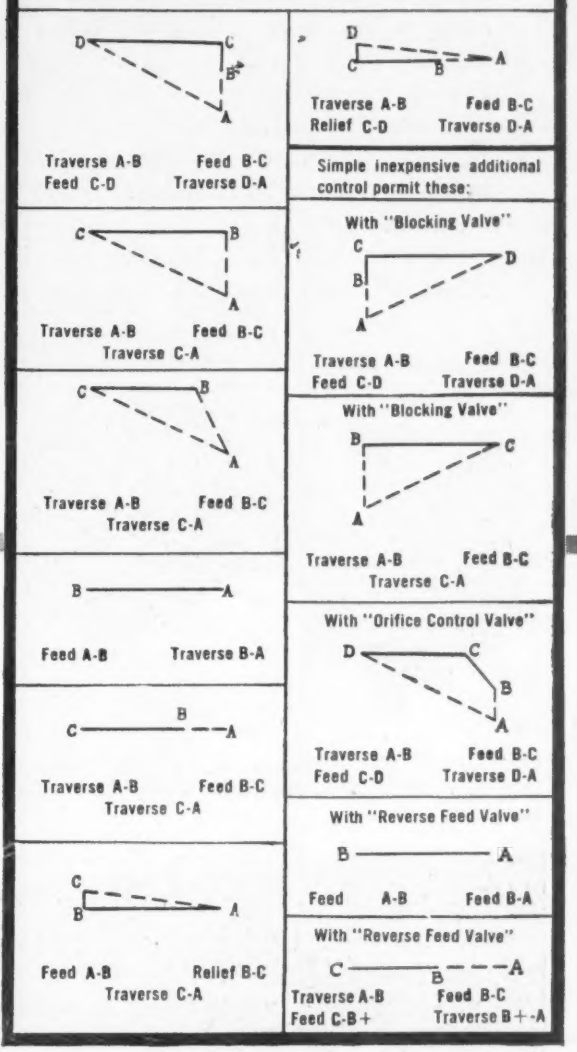
A DOZEN DIFFERENT MACHINING CYCLES

with the

FRONT CARRIAGE ALONE



THE FRONT CARRIAGE on the STANDARD No. 12 WILL PERFORM THE FOLLOWING CYCLES

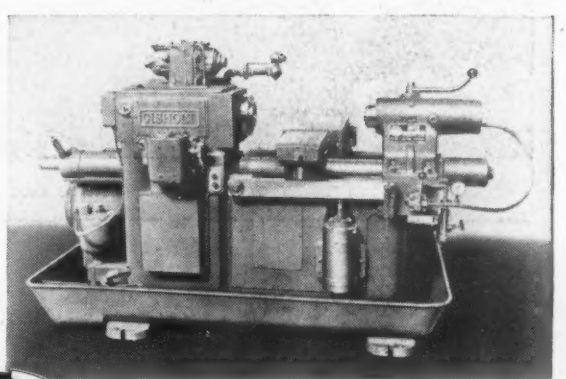


The Gisholt
HYDRAULIC AUTOMATIC LATHE

The versatility of the front carriage on this automatic lathe enables you to solve a great number of machining problems in the most efficient way.

Entirely hydraulic in operation, it permits many combinations of transverse and longitudinal motions at both feed and traverse rates. Many special combinations are possible on this standard machine. And still further variations may be obtained by means of special hydraulic equipment or cam guided blocks. A standard taper attachment can be utilized with any of the front carriage movements.

Versatility is only one of many outstanding advantages on the Gisholt Hydraulic Automatic Lathe. If speed, accuracy and easy operation can cut your costs on parts in large quantities or on a wide variety of small lots, ask for full information.



THE GISHOLT HYDRAULIC AUTOMATIC LATHE *is a genuinely rugged 12" machine. It is completely automatic in operation, remarkably easy to set up, and ideal for between-centers or chucking jobs. Write for literature.*

GISHOLT MACHINE COMPANY

1245 East Washington Avenue • Madison 3, Wisconsin

Look Ahead . . . Keep Ahead . . . with Gisholt

GISHOLT

TURRET LATHES • AUTOMATIC LATHES • SUPERFINISHERS • BALANCERS • SPECIAL MACHINES

Ornametl...beautiful woods

as workable as metal

A unique material with far reaching possibilities, Haskelite* Ornametl offers many advantages in building industrial and consumer products. With Ornametl, Manufacturers can now utilize the rich, luxurious appearance and sales appeal of beautiful woods without the limitations usually connected with wood fabricating methods!

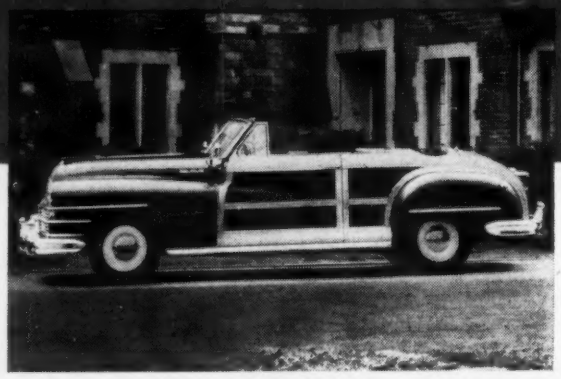
Ornametl may be stamped, pressed or rolled to shape. It can be sawed, drilled, punched and fastened by welding, nailing or with metal screws or rivets.

A few of the present uses for Ornametl illustrated below, demonstrate how it may add to the performance and salability of your products.

Write for SC-47 and "Material of Opportunities." This free literature outlines Ornametl and other Haskelite structural materials.

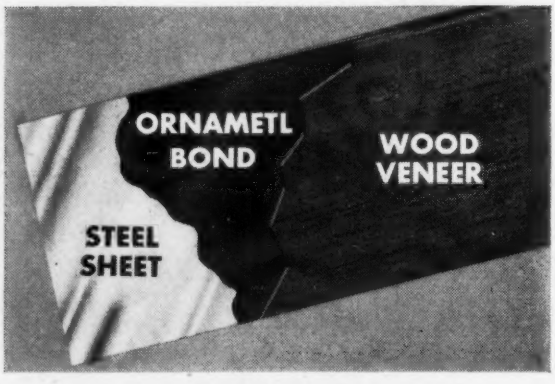
*T.M. Reg.

ORNAMETL offers unusual opportunity for building new attractiveness, new utility into office furniture.



ORNAMETL is ideal for passenger car bodies and interiors . . . house trailer interiors . . . bus interiors.

ORNAMETL has many advantages for the decoration of homes, offices, hotels and restaurants.



ORNAMETL is made by bonding a thin veneer of selected wood to a thin steel sheet.

HASKELITE T.M. Reg. *structural materials for men who build better*

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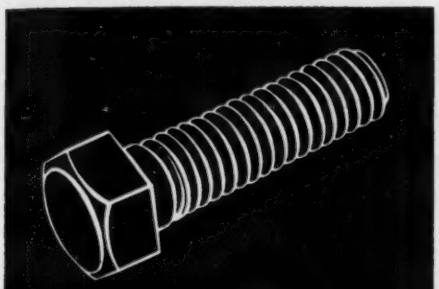

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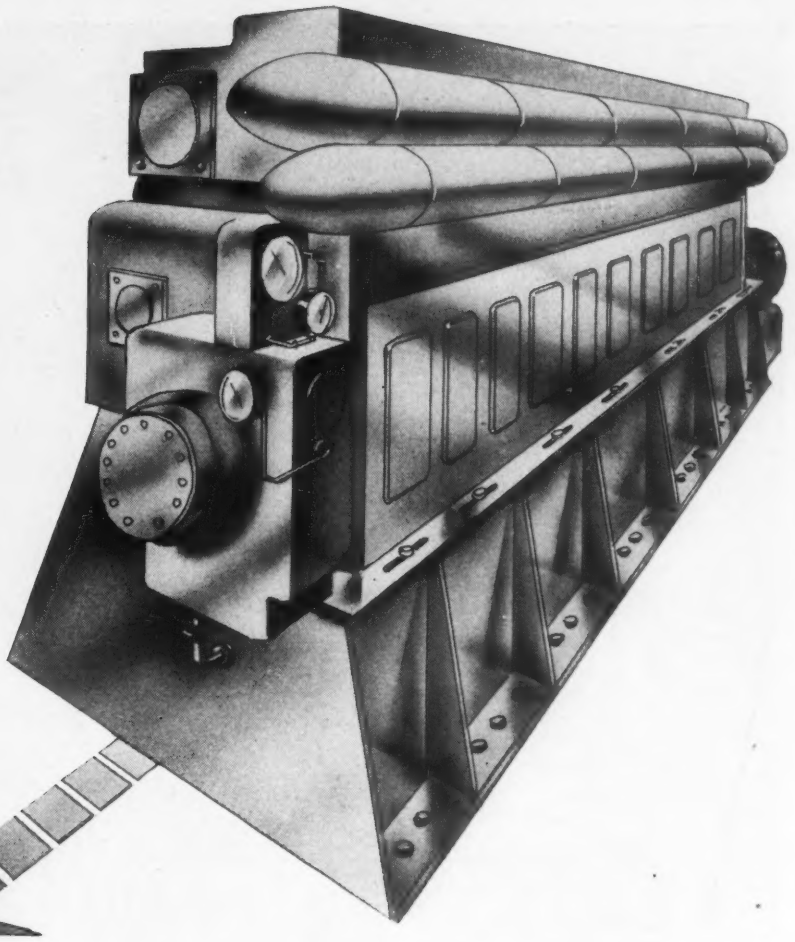

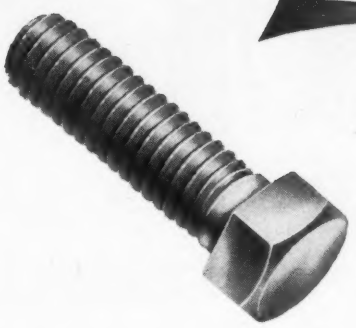

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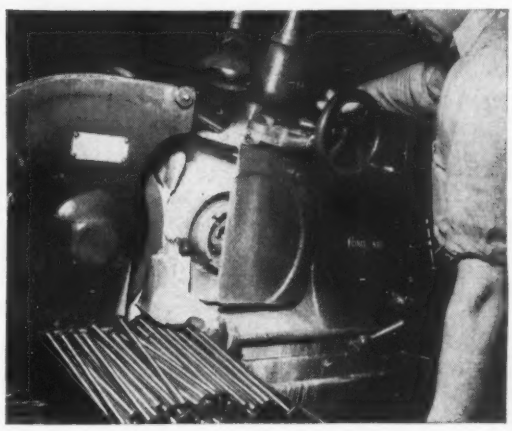

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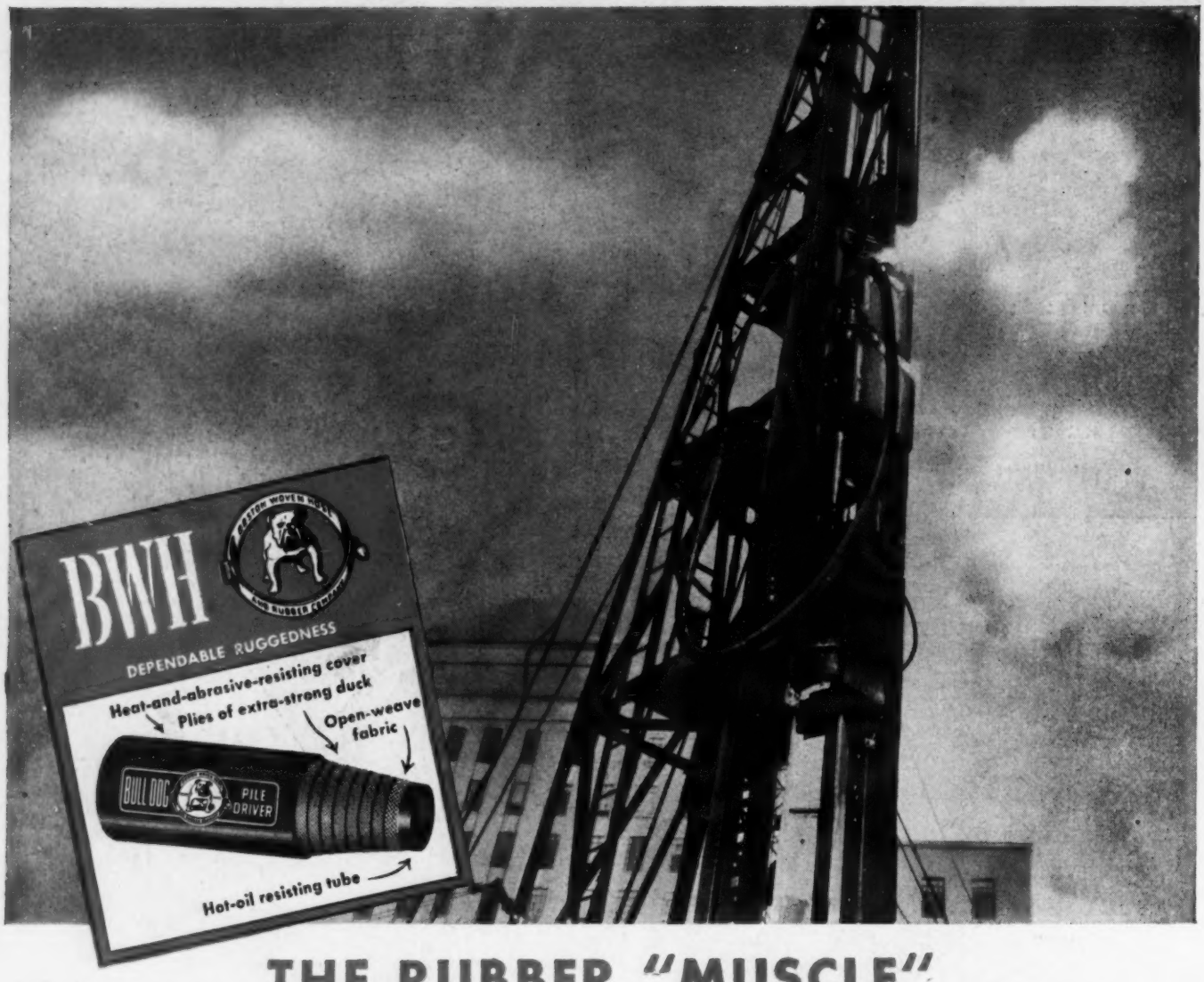

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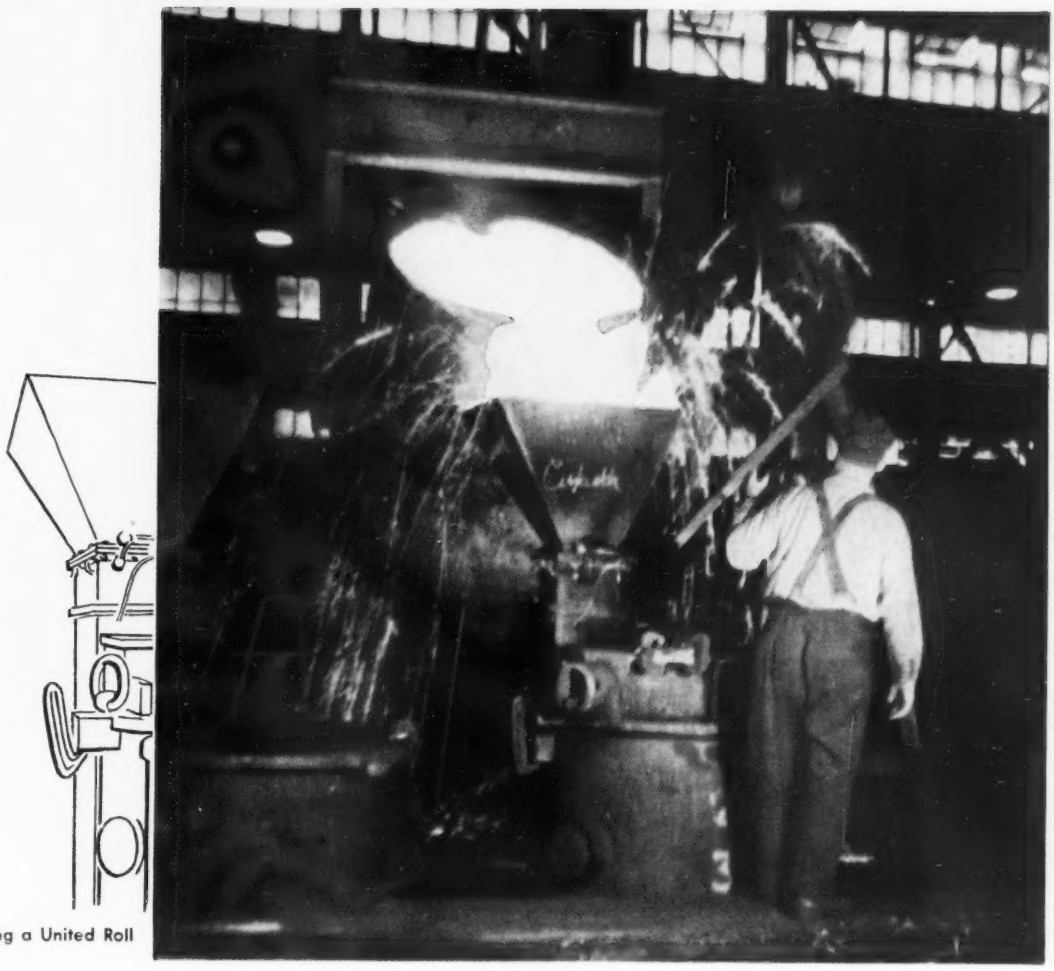

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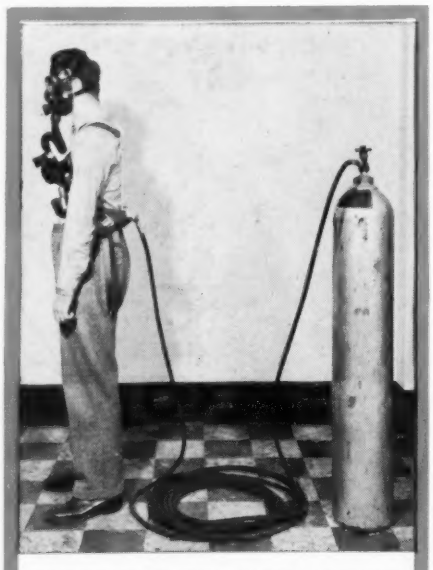

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NEXT WEEK . . .

Cutting Costs, Increasing Output with Modern Machine Tools—Cutting Off
Gas Fluxing of Secondary Aluminum
Automatic Electric Arc Furnace
Tempering Tool Steels
High Temperature Tensile Testing

STEEL

The Magazine of Metalworking and Metalproducing

VOL. 121, NO. 4 JULY 28, 1947

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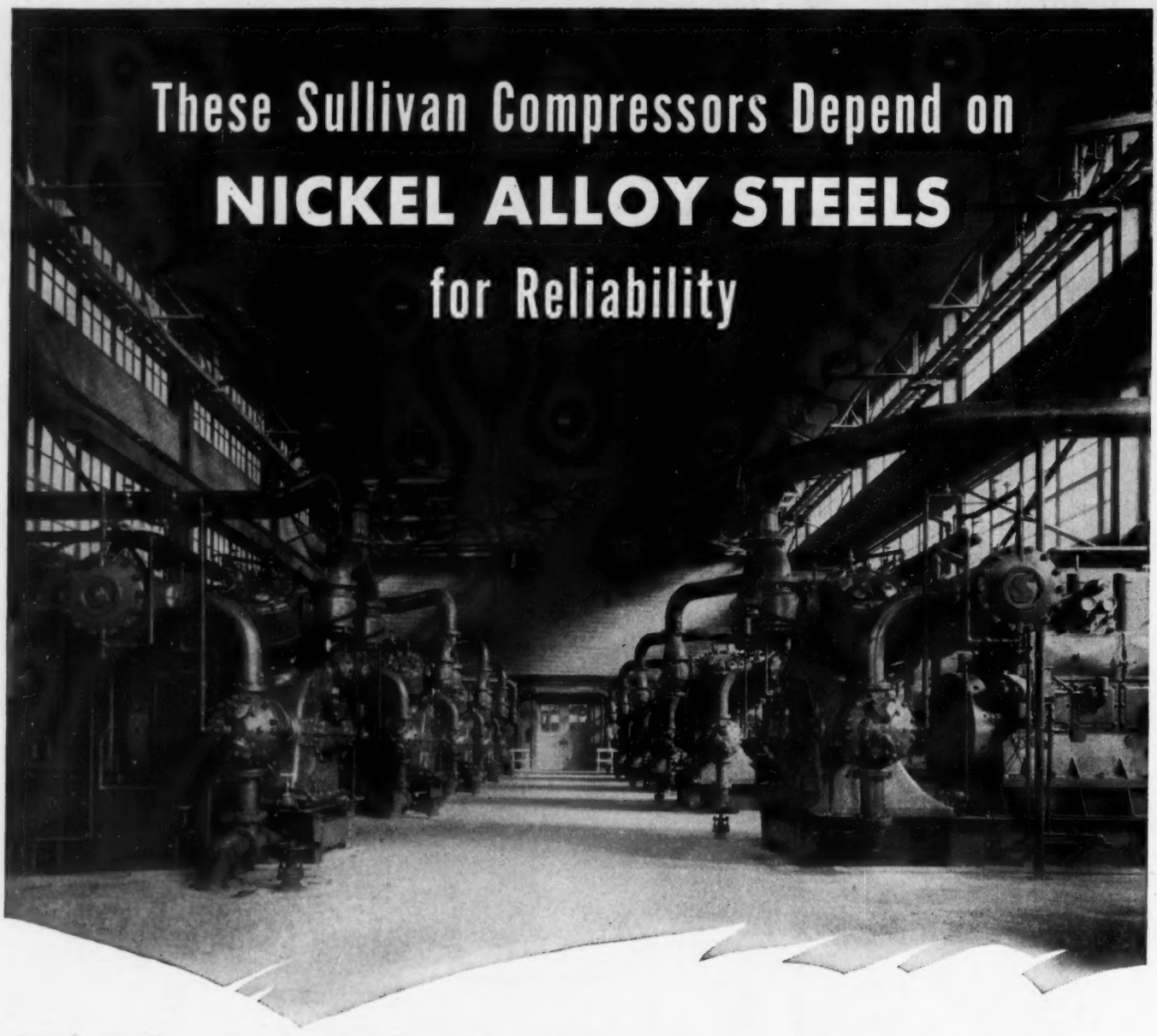

These compressors, built by the Sullivan Division of Joy Manufacturing Company, are a good example of the way Nickel alloy steels help make equipment longer-lasting and more dependable.

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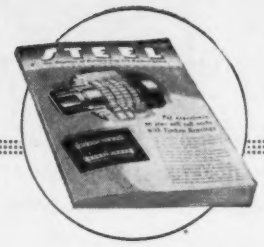

July 28, 1947

Record Boner

Every individual or organization of individuals whose actions are important enough to attract the favor or dislike of the public has at one time or another pulled a terrific boner. One cannot think of any outstanding personage who has not committed at least one error in public relations for which he would give a king's ransom to erase. Nor can any group exult in perfection in the art of putting one's best foot forward. Representatives of business—individually and collectively—have only a mediocre record in this respect.

But of all the boners ever committed in this category, none is quite as childish or inexcusable as that which union leaders are perpetrating in their hysterical zeal to make the Taft-Hartley Act look bad.

Consider the record to date. John L. Lewis, taking advantage of a situation that caused mine operators to accept almost anything to avert another coal strike, puts over a contract with an "able or willing to work" clause which makes one wonder whether the contract really is binding.

American Federation of Labor, some of whose leaders are supposed to be well-intentioned individuals, comes out with an appeal to members to organize labor-consumer co-operatives "for producing and distributing the necessities of life." If this program were to be carried out, small business would be doomed.

Music Czar Petrillo, appearing before the House Labor Committee, threatens to put his unions into the business of manufacturing records.

Congress of Industrial Organization announces a new 11-point program, No. 10 of which reads: "In the light of present economic tendencies, it may become necessary to give serious consideration to public control, either through regulation or ownership, as a means of curbing monopoly practices."

On top of these gestures are the open boasts by union leaders that they will ignore or violate certain provisions of the Taft-Hartley Act.

It is difficult to square these threats of defiance, nationalization of industry and union ownership of business with constructive objectives of the labor movement. Each hysterical threat spells as much disaster for labor as for capital. We cannot believe that labor union chiefs are foolish enough to commit suicide for unions in order to discredit the Taft-Hartley Act.

The entire program is an ill-considered bluff which will boomerang with tremendous force. The American public is in no mood for labor defiance or dictation. That is why the present campaign is such a colossal boner.

* * *

PROSPERITY FORMULA: While Detroit Editor A. H. Allen is on vacation, three top-flight automotive authorities have accepted invitations to serve as guest editors of "Mirrors of Motordom." The first is James D. Mooney, whose discussion on steps he thinks should be taken to stabilize the economy and assure continued prosperity appears in this issue.

Mr. Mooney believes we must do four things to shake ourselves down from our present uncomfortable position. They are (1) increase production, (2) reduce the federal debt, (3) reduce the tax rates, and (4) establish a free gold market.

The war debt alone, he points out, is a first mortgage of $6000 against every family in the country. This debt threatens the industrial health of the nation in that corporations are required to pay out a dangerously high cash outlay for taxes.

Mr. Mooney contends that reducing the corporate tax burden substantially would break the inflationary spiral. "We are confusing rates of taxes with dollars of taxes," he says. "It has been proved in in-

(OVER)

AS THE EDITOR VIEWS THE NEWS

dustry and applies equally well to taxes that a reduction in rate increases rather than decreases the actual dollar return."

His final suggestion is to establish a free auction market for gold to end the present era of "funny" money.

The ideas presented by the president and board chairman of Willys-Overland Motors merit the close attention of executives in the metalworking industries. —p. 59

• • •

PRAISE FOR MACHINES: Most readers of President Truman's midyear report to Congress on the state of the nation's economy probably have appraised the message as strong in stated objectives but weak in certain practical details. His arguments for restraining inflationary tendencies did not include any reference to what could be accomplished by reducing unnecessary government expense. His statements of labor's responsibility in regard to prices do not jibe with some of the President's actions on labor legislation.

However, there is one point on which Mr. Truman can take liberal credit. Throughout the 82-page report are numerous references which indicate a real appreciation of what modern labor-saving machinery and equipment can do to improve the economy. For instance, he said, "Management can make a great contribution to increase output by seeing that the mines are equipped with the best products of modern technology."

It is good to hear praise instead of condemnation for the machine again emanating from the White House. —p. 50

• • •

MECHANICAL GIANTS: At the time of the recent coal-wage settlement, comment was made that the increased costs of removing coal from underground mines undoubtedly will furnish additional impetus to the growth of strip mining. Improvements in power shovels has made it economical to strip mine coal at depths that were prohibitive a decade ago.

A similar trend toward increased capacities has been developing in the design and construction of dredges. Bucyrus-Erie Co. recently completed two placer dredges for excavating tin-bearing sand and gravel in the Dutch East Indies. The digging ladder for each dredge is 216 ft long, permitting removal of material lying 100 ft below water level.

Modern mechanical giants such as these dredges and power shovels help man to extract nature's minerals more cheaply and less hazardously, and from points hitherto inaccessible. —p. 90

SIGNS OF THE TIMES: For the first time since 1912 the War Department appropriation bill has emerged from Congress without a provision prohibiting studies of jobs in War Department establishments "with a stop watch or other time-measuring device." However, the Navy appropriation bill went to the White House (p. 54) with the customary ban on time studies. . . . American Car & Foundry Co. and subsidiaries have an order backlog of more than $250 million. Chairman Charles J. Hardy states (p. 62) he can see no lessening in domestic demand for railroad products in even the fairly distant future and that foreign needs will increase gradually as the world approaches normality. . . . According to the Aberthaw Index, cost of industrial construction dropped 3.5 points in the quarter ended June 30. This decline (p. 64), first since December, 1943, is attributed to lower material and subcontract prices. . . . Union Pacific railroad shops at Cheyenne, Wyo., have a set-up comprising an electric flash welder and a stripper (p. 75) by which four men—a welder, a stripper and two laborers—can safe-end sixty 5½-in. locomotive boiler flues per hour. . . . Now that members of Congress have had a chance to observe labor's reaction to the Taft-Hartley Act of 1947 (p. 52), many of them are disappointed over the extent to which the original provisions of the bill were watered down to insure overriding of the President's veto. . . . Howard I. Young, president of the American Zinc, Lead & Smelting Co., asserts that ours is not a "have-not" nation in regard to metals and minerals (p. 55), nor is it likely to become such. "With a continuation of good prices and sufficient manpower to carry on mining and development, the mining industry will continue to supply the major part of the requirements of the United States for copper, lead, zinc, iron ores and other minerals and metals that we have supplied in substantial quantities prior to World War II." . . . Coal shortage in France, as in the case of virtually every country in the world that has abandoned or modified the free enterprise system, has restricted steel production to the point where France—contrary to her prewar position (p 56)—now is a substantial importer of steel products. . . . If the good machinists who cut threads on engine lathes half a century ago could see the modern methods of performing this job (p. 76) they would turn over in their graves.

E. L. Shaner

EDITOR-IN-CHIEF

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STEEL
July
28
1947

Department of Commerce official tells Senate committee investigating steel shortage estimates of consuming industries indicate supplies in 1947 will fall short of needs by from 2 to 6 million tons

WASHINGTON

DEFICIT in steel supply may continue until the middle of 1948, and possibly may extend into 1949, H. B. McCoy, director, Industry Division, Department of Commerce, told the Senate committee investigating the steel shortage.

Placing estimates furnished by steel consuming industries against indicated capacity in product tons, the witness said:

"It would seem from the foregoing supply and demand comparison that a shortage of from 2 million to 6 million tons is indicated for 1947. However, the demand is greatest for specific types of steel products, particularly sheet, strip, pipe and tube, which constitute about 40 per cent of total steel products.

"The demand for sheet and strip is particularly heavy and the extent of the current overall steel shortage will depend to a large degree upon the accuracy of the demand estimates for these specific products."

Regardless of accuracy of such estimates, Mr. McCoy continued, it is generally agreed that the supply of such products is not sufficient to fully meet immediate needs.

Commenting on steel industry executives' views that demand and supply would come into closer balance in the near future, when adequate inventories have been accumulated and some of the present abnormal demands reduced, the witness said however:

"It is our opinion that there will be a deficit in supply for some months, and that full satisfaction of all demands may not be met before mid-1948, or early 1949."

He indicated this expectation is based on an anticipation that extra supplies, that might become available after inventories have been satisfied, might be diverted to meet in full demands from industries which will absorb substantially more steel than current levels—for example, he said, the automobile industry will very probably use a very substantial amount of additional steel above present consumption for a year or more, likewise, the petroleum and railroad industries.

However, said Mr. McCoy, short-term "current ingot producing capacity appears to be adequate to make all the finished steel that available rolling equipment can produce."

Meanwhile, Sen. George W. Malone (R., Nev.) blamed short steel supply for talk of an oil shortage this winter. The "spot shortage," he said, predicted for this winter in the Midwest, will be the result of lack of steel to build either pipe lines or tank cars. Also, he said, a shortage of steel for oil-drilling equipment has resulted in a reduction of 67,000 in the number of wells that would have been producing in the past 5 years.

The Senate steel subcommittee has had so many complaints of shortage of steel pipe, it was learned, that it decided to cover this phase of the situation also.

"The necessity of supplying the relatively small amount of steel pipe needed for well-casings and carrying lines for

Workman signals craneman as huge steel ingot is maneuvered out of a car-bottom furnace at Homestead Works of the Carnegie-Illinois Steel Corp., U. S. Steel subsidiary

farm and ranch watering systems in the Midwest is an emergency that must be met by the steel industry," Chairman Edward Martin of the steel committee stated. Demand for farm pipe has increased five-fold since the war, he said. This need is estimated at between 10,000 and 15,000 tons of steel pipe, apart from larger industrial needs which have been discussed before the committee.

Government intervention to increase steel capacity, if private industry is unwilling to increase its facilities to meet postwar demands, was urged by Walter P. Reuther, president, United Automobile Workers, CIO, before the Senate steel subcommittee last week.

Taking issue with earlier statements before the committee by steel industry spokesmen as to capacity in relation to steel demand, Mr. Reuther said, "We believe the steel industry in America is selling our future short."

His appearance coincided with shutdowns in automobile production due to steel shortages which the industry attributed to the coal workers' holiday recently, and his testimony was largely devoted to curtailed employment in automobile manufacture, which he blamed largely on lack of steel.

However, at the conclusion of his presentations, Sen. Harry P. Cain, Washington, presiding, reminded Mr. Reuther that "if men lay themselves off, they can't produce."

Strikes Cause Shortages

The first cause of the steel shortage, Senator Cain continued, has been attributed in testimony before the committee to strikes—in the coal industry, the steel industry and the electrical industry. This last, the senator recounted, was a major factor in holding up construction by the steel industry of new facilities this year, according to information given the committee.

"We have had testimony that 22 million tons of steel were lost from such causes in the first year after the war," Senator Cain said.

This, he said, made the industry short by at least 3 months' supply. Testimony to the committee was that if these interruptions had not occurred there would have been no shortage.

Mr. Reuther argued that the auto workers' strike should have given the steel industry a breather, and that, in fact, the strike periods balanced the steel industry's own curtailments.

The witness urged a survey to determine what percentage of government-owned steel facilities are in use, and if private capacity continues unequal to requirements, to put idle government plants back in operation. He said he would do this by private operation preferably, but "by government as a last resort."

H. B. McCOY

He departed from his prepared statement to warn that a lagging scrap supply threatened a crisis not only to steel production, but in the nation's industrial employment.

"Unless we get scrap to the steel mills," he told the committee, the country faces "a crisis by January."

He urged revival of wartime scrap collection by civilians, as well as a government move to insure that European war scrap is returned to this country. Besides government subsidization of postwar costs, Mr. Reuther said government boats should be allocated for removal of foreign-based scrap, obsolete ships and war equipment be broken up, and other steps taken to insure a larger scrap supply.

Testifying before the Senate committee recently, Water S. Tower, president, American Iron & Steel Institute, said that present and projected steelmaking capacity will be sufficient to care for needs of consuming industry beyond 1950. Supporting his position, he introduced statistical data showing maximum estimated consumption of 18 major consuming lines for their peak production year between 1923 and 1941, total requirements being a little more than 37 million tons of finished steel. As these 18 consuming lines account for 75 per cent of finished steel consumption, if all peacetime record demands had occurred at one time, an annual supply of slightly less than 50 million tons would have been sufficient to satisfy their needs. Consequently, the present output rate of 66 million tons of finished steel annually indicates that on the basis of past peacetime performance something like 15 million tons are available for unanticipated demands.

The committee last week also took up the export situation again. William C. Foster, acting secretary of commerce, detailed steps he is taking to conserve our domestic steel and steel pipe supplies.

Although committee counsel had some difficulty in eliciting a flat answer as to whether the State Department was prevailing in matters involving disputed steel exports, the committee was told by Mr. Foster that recently steel plate and steel pipe and tubing have been re-established under individual license. This controls the country of destination, also to a large extent the end-use of the products when shipped overseas. Also returned to export control have been seamless pipe and tubing, and Mr. Foster said, currently his office is approving export of pipe and tubing only for essential petroleum use abroad.

Homer Zopf, special consultant on iron and steel exports, told the committee that western European steel production this year will not exceed 27 million tons, and that "the entire world now looks to the United States for its import requirements of iron and steel."

While Russian steel production is reported to be at an annual rate of 25 million tons, said Mr. Zopf, "none of this steel will be available for Europe and the rest of the world."

Furthermore, counting steel siphoned off from other producing countries under its control, Russia and its satellites will produce and keep for internal consumption close to 30 million tons of steel this year.

U. S. Looked to for Exports

Whereas western European producing areas supplied the major part of the export market prior to 1937, said Mr. Zopf, pressure is now on the United States supply, with a current export demand of 10 million tons of iron and steel products.

A "grave" scrap situation this winter was forecast by Robert W. Wolcott, chairman, Steel, Foundry & Scrap Industries' Committee on scrap, when he appeared before the committee.

"The current situation is particularly critical because consumption of purchased scrap at approximately 2,200,000 gross tons per month is at a record-breaking level," Mr. Wolcott testified. "At the same time, current visible stocks of scrap in the hands of both consumers and dealers are the lowest on record. They barely total 2,500,000 tons, or less than a 5-weeks' supply. And of this quantity," he continued, "a substantial percentage is not chargeable—in other words, it is unprepared scrap."

Crediting scrap dealers with "doing a good job" he was critical of government retention of obsolete equipment and ships

when they could better serve as scrap for the present steel demand.

Another witness heard by the committee last week was Frank R. Nichols, Nichols Wire & Steel Co., Davenport, Ia., who testified that many small businessmen are unwilling to talk about alleged abuses in the distribution of steel because they fear being cut off from their present supply sources.

He suggested a 5-point "code of ethics" for the steel industry which would abolish tie-in sales of scrap for semifinished or finished steel; the steelmakers would determine needs for steel and agree to manufacture it in sizes and types needed; steel would be shipped where it is needed and not just to territories where there are no extra freight charges; premium prices on steel for export would not be accepted; existing surplus steelmaking facilities would be utilized to the fullest.

Mr. Nichols declared that some scrap dealers are trying to take advantage of the present situation by selling their scrap to mills which in turn provide the scrap dealers with semifinished or finished steel. Invariably, he said, this steel finds its way into the black market.

Following Mr. Nichols' testimony the committee recessed but it was understood top steel industry executives may be called to a conference with the committee in Washington within the next three weeks to help work out a voluntary program for relieving the steel shortage. George Meredith, executive director of the Steel subcommittee, also said a request of the CIO steelworkers to testify would be granted in the next two weeks. Philip Murray, CIO president, is understood to have asked that an economist of the union be permitted to present his views on the subject.

Sponsors of Machine Tool Congress Name Speakers

Program of the Machine Tool Congress to be held concurrently with the Machine Tool Show in Chicago Sept. 17-26 has been announced. Participating groups are the American Machine Tools Distributors' Association, the American Society of Mechanical Engineers, the American Society of Tool Engineers, the American Foundrymen's Association, the National Electrical Manufacturers Association, the Chicago Technical Societies Council, the Society of Automotive Engineers and the National Machine Tool Builders' Association.

Presiding at the opening meeting Sept. 17 at Hotel La Salle will be George Habicht Jr., president, AMTDA, and of Marshall & Huschart Machinery Co. Opening remarks will be by K. H. Hobbie, president of the congress and vice president, Driver-Harris Co., and Herbert H. Pease, president of NMTBA and of New Britain Machine Co. Speaker will be Fulton Lewis Jr., news commentator, whose topic is "Democracy with a Gun in Her Ribs."

The Production Engineering and Machine Design Divisions of ASME will sponsor the session on Sept. 18 at the Continental Hotel. Speakers will be J. L. Wilson, Thompson Grinder Co., discussing "Form Grinding" and J. F. Lincoln, president, Lincoln Electric Co., on "Fabricated Construction in Machine Tools."

A joint session by ASTE and AFA will be held Sept. 19 at the Hotel Sherman to be addressed by Myron S. Curtis, assistant director of engineering, Warner & Swasey Co., whose subject is "Turning Points in the Metalworking Industry" and T. E. Eagan, chief metallurgist, Cooper-Bessemer Corp., and past chairman, Gray Iron Division, AFA, who will speak on "When and How To Use Cast Iron."

The speaker at the session on Sept. 22 at the Palmer House, which will be sponsored by NEMA, will be C. S. Kettering, research consultant, General Motors Corp.

Dr. Gustav Egloff, president of the Chicago Technical Societies Council and director of research, Universal Oil Products Co., will preside at the Sept. 23 meeting at the Electric Association's quarters in the Civic Opera Bldg. Mr. Hobbie will welcome the audience, and the address "Machine Tools and the Philosophy of Production" will be presented by Mr. Habicht.

The ASME's Production Engineering Division and the special committee on metal cutting data and bibliography will act as host Sept. 24 in the Continental Hotel where the speakers will be Michael Field, Cincinnati Milling Machine Co., discussing "Practice and Theory in Carbide Milling" and J. R. Longwell and Fred W. Lucht, Carboloy Co., speaking on "Recent Developments in Carbide Application."

Concluding session of the congress will be held Sept. 25 at the Knickerbocker Hotel when the SAE will present as principal speaker Joseph Geschelin, Detroit editor, *Automotive Industries*, whose topic will be "A Trip Through the Machine Tool Show."

The National Machine Tool Builders' Association, show's sponsor, will give a dinner on Sept. 23 at the Palmer House in honor of foreign visitors. Toastmaster at the dinner will be Charles J. Stilwell, president, Warner & Swasey Co.

Present, Past and Pending

■ FANSTEEL ACQUIRES WEIGER-WEED CO. AT DETROIT

CHICAGO—Fansteel Metallurgical Corp. has acquired the Weiger-Weed Co., Detroit, producer of refractory alloys, resistance welding dies, water-cooled electrode holders and accessories used in resistance welding. The company, which was organized since the end of the war, will be operated as a division of Fansteel.

■ AUTOWORKERS SEEK TO ESCAPE DAMAGES FOR STRIKES

DETROIT—UAW-CIO workers at the Detroit and Ecorse plants of the Murray Corp. of America last week walked off their jobs in an attempt to force the company to include a clause in its labor contract freeing the union of liability to damage suits for contract violations as provided by the new labor law.

■ RECAPITALIZATION PLAN FOR ALAN WOOD REPORTED

NEW YORK—Reports are current in financial circles that a recapitalization plan for the Alan Wood Steel Co., acceptable to all stockholders, will be presented shortly.

■ NEW ALUMINUM ALLOY ROOFING MATERIAL PRODUCED

PITTSBURGH—Production of a new, high-quality aluminum roofing material for industrial use, to be called Alco industrial roofing, was announced last week by the Aluminum Co. of America. The new product is lightweight, heavy-duty specially-formed material and is made from a special aluminum alloy.

■ CITY AUTO STAMPING CO. PLANS BIG EXPANSION

TOLEDO, O.—City Auto Stamping Co. plans $1 million expansion program which includes construction of two modern buildings and installation of four giant presses costing more than $500,000.

■ LOCKHEED AIRCRAFT REPORTED REDUCING PAYROLL

BURBANK, CALIF.—Lockheed Aircraft Corp. is reported reducing its working force by 100 employees weekly as fabrication of parts is completed for Constellations now on order. During June the working force declined from 15,000 to 14,432 and there now are 14,100 on payrolls. By the end of the year the number is expected to be down to 12,500.

Consumers' Steel Receipts up Sharply

Shipments from mills in first four months of 1947 show gain of 57 per cent over movement in like 1946 period. Warehouses receive largest proportionate tonnage

METAL consuming industries received 20,447,287 tons of steel during the first four months of 1947, the American Iron & Steel Institute reported last week.

This was an increase of 57 per cent over shipments in the corresponding period of 1946 when consumers received only approximately 13 million tons. The periods, however, are not wholly comparable, strictly speaking, in view of the fact early-1946 production was severely curtailed by the steel strike.

Jobbers, dealers and distributors received the largest aggregate amount, 3,461,794 tons, or 16.9 per cent of the total shipped, during the first four months this year.

Shipments to the automotive industry in the period amounted to 2,984,749 tons of finished steel products, an improvement of 14 per cent over the total shipped during the preceding four months.

Shipments to freight car builders during the first four months of 1947 at 686,553 tons, equivalent to the amount needed for approximately 31,000 new domestic cars, showed an 18 per cent gain over the total steel received by this group in the previous four months.

Finished steel shipments destined for the oil and natural gas industry during the early months of 1947 were one-third larger than during the final four months of 1946. The amount of steel shipped directly for export was 7 per cent of the total steel shipments in the first four months of this year.

The automotive industry received 14.6 per cent of the total steel shipped, slightly better than its share of shipments in 1941. Construction received 9.6 per cent of total steel, 8 per cent went to steel for converting and processing, while rail transportation took 7.9 per cent, machinery manufacturers received 5.3 per cent, and contractors' products accounted for 3.7 per cent of total shipments, electrical machinery and apparatus consumed 2.6 per cent, appliances, utensils and cutlery received 2.5 per cent, and other domestic and commercial equipment accounted for 2.8 per cent.

In the first four months of 1947, sheet and strip shipments to the auto industry totaled 1,856,815 tons. The auto industry's share of sheet and strip shipments amounted to 31.3 per cent of total tonnage shipped, as against 27.8 per cent in 1946.

Shipments of finished steel to freight car builders during the first four months of 1947 amounted to 686,553 tons, an 18 per cent gain over the 583,219 tons received by this group during the last four months of 1946.

During 1946 net shipments of steel products to consuming industries totaled 48,775,532 net tons.

Release of these data was delayed several months because of changes in the method of reporting, according to the institute.

Says 166,500 Tons of Scrap Could be Salvaged in Pacific

It is physically and economically feasible to return to the United States approximately 166,500 tons of iron and steel scrap now located in various Pacific combat areas, says a special committee appointed by Secretary of Navy James Forrestal in a report on scrap accumulations.

In a tour of the Pacific Ocean area from May 20 to June 12, the committee found 15,000 tons on Guam, 101,500 tons at Subic Bay and 50,000 tons at Manila. The committee discovered much more scrap than this, particularly at Manila with an estimated 100,000 tons on sunken ships, but declares that this could not be salvaged physically or economically.

Distribution of Steel Products–January-April, 1947

(In net tons of leading products of all grades of steel, including alloy and stainless)

Market Classification	Shapes	Plates	Hot Rolled Bars	Cold Finished Bars	Seamless Tubing	Drawn Wire	Hot Rolled Sheets	Cold Rolled Sheets	Coated Sheets	Hot Rolled Strip	Cold Rolled Strip	Total (All Products)
Converting and Processing												
January	3,476	42,912	221,849	13,370	15,308	86,248	79,492	3,854	964	41,207	7,975	902,416
February	3,774	40,769	186,508	12,560	10,331	83,257	61,395	4,188	507	37,919	9,040	807,940
March	4,287	52,146	216,013	14,236	15,784	82,394	85,305	8,961	672	41,795	9,137	954,939
April	2,764	45,457	210,741	15,498	12,582	93,713	73,011	4,593	1,210	37,384	9,033	943,584
Jobbers, Dealers, Distributors												
January	60,747	71,460	99,349	49,410	73,639	15,523	74,769	34,044	39,467	11,151	4,428	851,271
February	65,617	69,258	89,110	46,601	58,713	14,143	72,535	30,332	29,206	10,486	5,260	791,822
March	74,587	78,095	106,726	50,665	70,898	14,156	77,051	40,400	34,008	11,035	5,003	886,133
April	73,784	83,079	100,190	48,536	78,630	17,106	82,736	38,628	37,204	10,109	4,070	932,563
Construction, Maintenance												
January	149,977	103,251	26,408	483	23,946	858	27,776	3,445	8,126	6,670	2,094	458,789
February	143,830	105,974	24,873	484	20,116	581	22,918	3,481	5,660	3,904	1,200	446,745
March	158,425	124,904	31,581	418	36,711	474	29,317	2,737	7,309	4,487	1,201	517,572
April	160,807	130,967	33,958	302	22,403	1,238	31,737	2,546	8,094	5,402	2,376	528,248
Contractors' Products												
January	718	10,970	14,015	983	2,831	3,523	60,688	30,237	36,777	9,128	5,669	192,210
February	892	12,522	13,394	1,221	2,016	3,500	51,638	30,731	35,872	9,580	4,859	180,838
March	899	12,941	15,351	1,114	2,354	2,487	51,703	36,848	42,571	8,858	6,146	198,301
April	627	13,936	15,682	762	2,306	3,126	48,990	30,085	35,592	8,453	5,820	183,447
Automotive, excl. Tractors												
January	4,272	24,725	128,682	25,345	1,369	18,637	172,827	212,006	8,413	40,761	25,679	698,742
February	3,276	24,532	120,901	23,599	652	17,391	141,874	202,504	6,376	37,113	22,059	630,641
March	4,168	29,937	150,897	25,847	1,693	21,663	173,494	248,460	7,173	41,970	25,184	766,645
April	4,579	32,607	144,345	25,379	2,104	19,313	174,439	230,509	8,380	43,877	29,167	748,880
Rail Transportation												
January	55,081	65,778	40,616	661	258	284	19,221	2,173	3,880	2,461	526	428,911
February	39,497	39,969	28,216	558	190	123	23,516	2,352	2,630	3,635	291	352,911
March	54,537	78,147	37,864	707	829	180	23,913	3,526	3,354	3,069	240	400,253
April	49,569	80,425	37,424	682	519	346	27,528	3,140	4,217	2,294	315	430,787

Distribution of Steel Products–January-April, 1947

(In net tons of leading products of all grades of steel, including alloy and stainless)

Market Classification	Shapes	Plates	Hot Rolled Bars	Cold Finished Bars	Seamless Tubing	Drawn Wire	Hot Rolled Sheets	Cold Rolled Sheets	Coated Sheets	Hot Rolled Strip	Cold Rolled Strip	Total (All Products)
Shipbuilding												
January	3,124	16,173	2,022	204	154	201	1,191	479	528	162	55	25,003
February	2,391	14,709	2,196	205	35	69	1,306	372	813	321	4	22,724
March	4,793	16,735	2,437	145	174	25	1,580	346	552	206	7	27,687
April	4,765	19,757	2,842	283	....	44	1,100	381	410	184	6	30,543
Aircraft												
January	....	277	191	299	101	67	236	304	133	313	114	2,678
February	....	245	437	334	511	22	155	327	112	111	138	2,571
March	....	309	367	480	109	23	75	246	69	181	210	2,311
April	....	429	323	464	189	68	222	185	100	217	289	3,551
Oil, Gas Drilling												
January	2,293	6,132	6,474	578	33,421	....	2,134	60	104	145	20	72,607
February	3,074	3,979	7,336	562	25,572	43	3,677	982	2	147	233	59,808
March	2,810	5,215	7,454	754	32,781	2	1,663	65	79	209	25	67,350
April	3,909	6,274	6,465	501	34,564	39	2,287	70	130	171	31	71,361
Mining, Quarrying, Lumbering												
January	1,058	4,021	5,494	264	70	121	1,476	107	124	43	33	18,010
February	1,303	3,081	5,841	208	325	242	1,318	325	181	77	11	23,785
March	1,755	4,207	5,098	151	147	265	1,443	338	39	293	3	20,097
April	2,729	4,145	5,883	179	223	350	2,119	183	171	174	2	24,695
Agricultural												
January	3,794	6,140	39,699	5,956	74	2,229	12,373	3,378	9,817	8,906	405	98,253
February	4,050	4,837	37,678	5,439	193	2,768	13,668	2,609	7,235	8,652	235	93,915
March	4,336	6,298	44,806	6,551	123	2,568	16,106	2,672	8,839	9,497	407	109,924
April	4,561	8,222	41,603	5,486	110	2,806	15,696	2,445	7,419	8,226	283	103,301
Machinery, Industrial Equipment, Tools												
January	20,514	47,480	65,806	29,918	9,049	9,795	27,890	6,522	1,752	11,090	5,307	260,417
February	19,345	45,809	62,685	26,984	9,193	8,671	23,709	7,683	1,326	10,154	4,958	242,247
March	22,239	63,923	71,273	30,541	11,010	9,486	27,924	9,541	1,972	11,425	5,414	290,140
April	25,273	65,156	66,384	27,875	10,544	8,591	30,725	10,024	1,900	11,899	5,344	288,162
Elect. Mach., Equipment												
January	2,261	11,617	9,904	3,708	73	5,803	25,986	7,707	2,422	6,077	2,421	133,193
February	2,691	14,414	9,562	3,601	3	4,078	24,597	9,216	2,480	6,255	3,639	122,971
March	3,056	12,032	10,024	4,556	38	5,808	27,044	9,573	2,945	7,138	3,441	132,877
April	2,703	11,394	10,404	3,611	69	5,256	23,921	8,933	2,786	5,891	3,736	135,431
Appliances, Utensils, Cutlery												
January	197	989	2,158	3,781	165	4,919	23,570	49,197	7,605	3,246	7,076	132,689
February	288	371	2,019	3,603	441	3,490	23,513	35,524	5,827	2,918	5,168	106,743
March	95	643	1,933	3,809	551	3,458	27,292	45,407	8,692	4,680	7,102	129,515
April	62	1,262	1,953	3,719	436	2,918	32,077	50,723	8,264	5,127	7,175	141,474
Other Domestic, Commercial Equipment												
January	1,589	10,919	8,068	5,336	317	24,889	20,816	29,052	3,701	8,356	11,029	138,108
February	1,154	8,410	6,634	5,020	124	22,325	19,847	29,517	4,278	7,532	12,049	129,659
March	993	8,907	7,976	5,001	404	22,547	22,409	35,523	4,362	8,655	15,087	144,006
April	937	10,976	7,991	4,980	1,045	23,673	18,747	36,689	4,817	9,221	15,161	148,603
Containers												
January	7	14,100	709	22	....	8,301	56,269	22,847	4,260	13,951	10,647	382,093
February	706	14,864	1,000	25	....	7,985	53,973	20,783	3,119	12,193	9,477	349,172
March	186	11,809	2,172	....	675	8,456	60,496	26,747	3,353	13,887	10,319	426,809
April	66	16,290	1,023	....	1,058	9,418	61,328	25,709	4,477	15,819	9,693	446,478
Ordnance, Other Military												
January	123	267	210	66	....	....	266	32	10	16	78	1,934
February	88	394	118	219	....	33	343	2	....	....	48	2,078
March	8	247	209	297	....	....	48	123	....	13	308	1,549
April	....	373	284	238	....	26	399	6	2	36	473	2,846
Unclassified												
January	26,924	3,032	57,503	15,833	15,145	39,745	24,408	4,458	5,255	3,648	38,050	386,698
February	10,129	2,252	39,738	14,632	15,478	41,278	26,015	4,809	3,689	2,026	33,563	302,114
March	25,096	....	56,754	16,725	13,779	44,243	29,037	4,106	4,724	891	40,269	373,074
April	20,353	2,884	58,175	17,347	16,521	39,462	30,133	5,193	3,380	3,682	41,680	372,164
Export												
January	26,096	45,046	39,989	3,576	13,410	8,185	14,738	6,713	6,476	5,433	1,183	349,555
February	32,067	43,457	41,888	2,846	14,727	9,009	19,665	10,289	5,305	6,155	1,095	347,250
March	27,677	34,737	41,133	3,866	14,884	8,650	17,497	10,762	5,749	6,100	1,428	355,963
April	34,640	39,292	37,616	4,023	13,310	8,752	20,264	10,790	6,213	5,079	1,511	373,596
Total												
January	362,251	485,289	769,146	159,793	189,330	229,328	646,126	416,615	139,814	172,764	122,789	5,533,577
February	334,172	469,846	680,134	148,704	158,260	219,008	585,662	396,026	114,618	159,178	113,327	5,015,934
March	389,947	541,232	810,068	165,863	202,944	226,885	673,397	486,381	136,462	174,389	130,931	5,805,139
April	392,128	572,925	783,286	159,865	196,613	236,245	677,459	460,832	134,766	173,245	136,165	5,909,714
*Less shipment to members of industry for conversion												
January	275	17,741	91,129	541	13,608	11,124	52,566	526	20	27,164	2,362	472,244
February	470	25,311	75,207	637	9,000	21,051	39,819	1,741	24	23,217	3,015	389,510
March	234	14,651	86,480	599	15,531	17,977	60,591	3,330	20	30,121	2,759	496,353
April	96	18,374	84,036	1,413	11,865	18,206	46,759	1,899	65	21,922	2,385	463,721
Net Total												
January	361,976	467,548	678,017	159,252	175,722	218,204	593,560	416,089	139,794	145,600	120,427	5,061,333
February	333,702	444,535	604,927	148,067	149,260	197,957	545,843	394,285	114,594	135,961	110,312	4,626,424
March	389,713	526,581	723,588	165,264	187,413	208,908	612,806	483,051	136,442	144,268	128,172	5,308,786
April	392,032	554,551	699,250	158,452	184,748	218,039	630,700	458,933	134,701	151,323	133,780	5,445,993

*All of these shipments were made to the group classified as "Converting and Processing."

WAA's Inventory Now 55 Per Cent Liquidated, Administrator Says

General Littlejohn, reviewing the disposal agency's activities over the last year, estimates final inventory value at $34 billion. Firming of machine tool inventory seen virtually completed with $637 million worth already sold

LIQUIDATION of almost 70 per cent of the $27 billion worth of war property declared surplus to date has been accomplished, and within the last year disposal totals have almost tripled, Maj. Gen. Robert M. Littlejohn, War Assets administrator, reported last week on the first anniversary of his appointment to head the largest merchandising enterprise in history.

Future acquisitions of surplus, with a value of about $7 billion, will bring the total value of war surplus to an estimated $34 billion. Thus, to date, General Littlejohn said, 55 per cent of this tremendous inventory has been disposed of.

Describing the condition in which he found the disposal agency when he assumed command, the administrator recalled how his office, on July 22, 1946, was expected to make every decision governing the operation of 33 regions; how his incidental chores included handling 7500 letters and 400 to 700 telephone calls a day. Inventory records at that time were inaccurate or nonexistent; accounting methods were unsound and managerial practices were enmeshed in red tape. Sales had dropped to a nominal figure and certification of priority groups had become so far in arrears many claimants refused to try to buy needed production equipment and facilities through WAA.

In the face of these obstacles, after a year's time Administrator Littlejohn reports these main accomplishments: (1) The $34 billion disposal job was 55 per cent complete by June 30, 1947; by June 30, 1946, only 15 per cent of the job had been accomplished; (2) disposals by WAA and other government agencies totaled $13.6 billion at acquisition costs —or nearly three times the amount disposed of prior to July 1, 1946; (3) rate of disposals had almost doubled; previously WAA was disposing of surplus at a monthly rate of 5.7 per cent of its total inventory, and for the first six months of 1947 had pushed up its rate to 10.2 per cent; (4) of the total disposals in the last 12-month period, sales accounted for $6.6 billion and leases, scrapping, donations, etc., accounted for $7 billion; (5) sales realization of $1.9 billion was 29 per cent of the original cost to the government, and after deduction of WAA operating costs, the net return was 22 per cent; (6) for the first six months of this year, disposals have averaged almost $1 billion a month.

Biggest single job of the General Disposal office has been to "firm" the machine tool inventory and step up sales of this machinery. The year-long inventory job is now virtually complete and a comprehensive sales program is in motion. To date, approximately $637 million worth of machine tools have been sold. The new program provides for orderly disposal of all machine tools, and to do this general purpose tools are to be offered for sale by catalogs.

Under the present program, the level of prices of general purpose tools is considered sufficiently low to attract all prospective buyers so that tools will be offered for competitive bid only in the event of emergency site clearance after adequate offering to priority and commercial buyers.

The machine tools program for the future includes the following points: Inventories and new acquisitions to be screened for over-age general purpose and special machine tools which will be disposed of for scrap and salvage; deactivation of smaller sites with emphasis on donations and nominal price sales of machine tools to educational institutions and transfers to the armed services; analysis of residual tools with a view to transferring some to the services and scrapping and salvaging other types.

Prices are to be reviewed by WAA and industry consultants as market conditions change; long supply tools are to be frozen at major sites for exporters; gradual expansion of discount sales will be made to dealers who purchase for resale and contraction of disposals through approved dealers will be carried out.

To stimulate foreign purchases of surplus machine tools and other equipment, WAA has under negotiation with a number of machine tool and industrial machinery manufacturers an arrangement by which these manufacturers would rehabilitate used government-owned surpluses originally built by them. The government would pay for the rebuilding expense, in return for which the manufacturers would guarantee the equipment's performance. Prospective foreign purchasers are interested in the surplus tools, WAA said, but insist that the original manufacturers stand back of their products.

In recognition of her sales ability, War Assets Administration recently gave Peggy Walsh, center, a special commendation certificate. Miss Walsh, who is a sales commodity specialist at the WAA Customer Service Center, Chicago, is shown displaying surplus items to Maj. Gen. Robert M. Littlejohn, right, WAA administrator, and Isaac Spalding, WAA zone administrator

Sheffield Steel Producing Pig Iron at Houston

Lighting of leased WAA stack inaugurates first peacetime iron production in modern blast furnace in Texas' history

HOUSTON, TEX.

PIG IRON production has been resumed by Sheffield Steel Corp. at the Houston blast furnace which it recently leased from War Assets Administration. In re-opening the 700-ton-daily blast furnace which it operated during the war, Sheffield Steel inaugurates the first peacetime production of pig iron from a modern blast furnace on a major scale in the history of Texas.

Output will go into soil pipe and nails for veterans' housing and other steel goods, R. L. Gray, president of Sheffield, said. Used as hot metal to supplement scrap iron and scrap steel in Sheffield's five open-hearth furnaces, it will increase the plant's output 25 per cent. It will eventually boost employment of Sheffield in Sheffield's Texas operations from the present 2500 figure to 3500.

The furnace is being charged with iron ore from Linder and Jacksonville, Tex.; manganese ore and a small percentage of high grade iron ore from Mexico; limestone from New Braunfels, Tex., and coke made from coal from New Mexico and Henryetta and Coaldale, Ark.

Mr. Gray said Sheffield was optimistic that this "experimental" operation would soon test whether the economic bugaboo that had thwarted for 100 years the profitable production of pig iron in Texas had been licked. He added that failure of the blast furnace was possible due to economic factors.

He explained that chances of making an economic success of the ship channel blast furnace would be enhanced if Sheffield had access to the high volatile coal mines at Carbon, Okla. Though under the terms of the agreement by which Lone Star Steel Co. of Dallas leased the government-built Daingerfield plant, Sheffield is entitled to purchase half of the production of the Carbon and McCurtain, Okla., mines, this provision of the lease has not yet been approved by the Department of Justice, making this coal as yet unavailable, Mr. Gray pointed out.

Following the traditional belief that good luck attends a blast furnace lighted by women, wives of high-ranking Sheffield Steel Corp. officials helped light the Sheffield-Houston furnace which had been cold since October, 1945. Left to right are: Mrs. R. H. Startzell, wife of the company's sales manager; Mrs. L. H. Juengling, wife of the secretary; Mrs. R. L. Gray, wife of the president; F. R. McFarland, works manager; J. S. Ferguson, blast furnace expert, American Rolling Mill Co; and Frank C. Davies, furnace and coke oven superintendent

Ford Pushing West Coast Parts Purchasing Program

The Ford Motor Co.'s parts buying program on the West Coast is developing faster than original predictions indicated, Lou C. Disser, vice president in charge of the program, told STEEL'S Los Angeles representative recently.

First estimates placed a minimum of two years on the letting of contracts totaling some $50,000,000 annually, Mr. Disser said. This estimated period will be "appreciably shorter," he added. Recently, 24 contracts were let in a 10-day period. Approximately 60 have been signed in southern California alone since the plan went into operation.

"The company has found it necessary to embark on an 'educational' program first of all," Mr. Disser said. "It was learned that West Coast manufacturers in general, accustomed to wartime-type contracts including a high percentage of airplane work, were at first loath to quote on automobile parts representing comparatively small amounts.

"When it was pointed out, however, that the Ford buying program could be but the forerunner of similar expansions by manufacturers in other lines, once the West's ability to produce on a peacetime competitive basis was established, a change was brought about in the attitude of potential bidders."

For the most part, manufacturers have been ready and willing to co-operate in the program, he continued, as is shown by the accelerating pace of contract placing. The company, meanwhile, has met these bidders half way by offering its research service whenever called upon, to speed production and cut down costs.

Mr. Disser stressed that the company has no desire to force down costs to the disadvantage of bidders but aims only to make purchases on a basis to insure the continuance of the West Coast program to the advantage of all.

Of the 2600 parts which the Ford Co. will order in the West under the buying program, some 100 parts already have been contracted for.

Ground has been broken for the new Lincoln-Mercury plant in Los Angeles. Occupancy of the 426,000 sq ft of floor space is slated for early in 1948. The plant capacity will be 250 cars a day, 200 of which will be Mercuries and 50 Lincolns. Some 1500 persons will be employed in the new assembly factory. It will comprise three single story buildings housing executive and production units and a 1-mile test tract. Total acreage is 26.

The Ford Long Beach plant is presently assembling 200 cars a day, but has a 300-car capacity.

The plant at Richmond, Calif., is rated at 400 cars a day.

New Farm Implement Firm Purchases Texas War Plant

Purchase from the War Assets Administration of the former Continental Motors Corp. wartime plant at Garland, Tex., by the newly organized National Equipment Co. of Texas Inc., has been announced. The company has plans to utilize the plant in the manufacture of farm tractors and auxiliary implements.

J. N. Laughlin, Marshall, Tex., president of the company, said the company plans to go into production as quickly as possible on a newly designed farm tractor, for which orders totaling nearly 2000 have been taken.

Truman Price Plea Not Expected To Check Inflationary Spiral

General markup of steel prices delayed pending completion of cost study but average rise of $3 to $5 per ton is indicated in making. Advances on consumer durable and capital goods likely to trail steel action

THERE appears little prospect that the new twist in the inflationary spiral set off by the recent coal wage boost can be checked short of a general advance in prices on consumer durable and capital goods over coming months.

Despite government pressure to hold the line on prices every sign on the economic horizon points to a substantial rise in steel prices in the immediate future, and such action is certain to be trailed by markups all along the line on products made of steel.

Last week the steelmakers appeared to be holding off price action pending completion of cost studies now under way. Whether President Truman's reiterated plea for restraint has anything to do with the conservative approach of the steelmakers to the price problem, the fact is clear no general markup seems likely in the industry until the leading producers are armed with facts and figures to justify whatever position they eventually choose to take.

Small Producers May Act Soon

Recent isolated boosts on certain products, such as pig iron, are considered exceptions to overall industry policy, in the main reflecting special circumstances. However, expectations are that some of the smaller producers may not await announcement of policy by the large interests before acting. In fact, specific product increases are understood to have been effected already by a few such makers and these raises do not follow a set pattern. When the leading producers act it is predicted an average markup of $3 to $5 per ton will be made with no one product being raised more than $7 per ton.

President Truman last week, in his midyear economic report, reiterated his earlier requests to industry to absorb the increased costs involved in the coal and steel wage agreements.

Declaring that "the increases that already have been made in coal prices are contributing to inflationary pressures," he continued: "Similarly, increases in the price of steel would have a widespread inflationary effect.

"Recent favorable earnings," he said, "should permit the absorption of an extraordinary cost over a short period in order to stabilize prosperity for the longer run.

"In no case," the President said, "should the particular wage increases in the mining industry be made the basis for wage demands in other fields governed by different circumstances."

At the same time, the President commented that, "In some cases wage increases are still needed to attain workable relations in the wage and salary structure and to alleviate hardship due to wages which are substandard or which have risen substantially less than the increase in the cost of living."

Except for such special circumstances, however, the President said, wage increases should be related to general trends in productivity and not made on a basis which forces price rises, or prevents price reductions needed to assure sale of increasing supplies.

The President referred in more detail to the recent coal wage agreement by saying:

"Under the recent wage settlement in the coal mining industry, the wages of coal miners occupy a place near the top of the wage structure. The earnings of the coal miners under the new contract must be judged in the light of the character of their work and the labor needs of the industry.

"Every effort should be made to absorb the cost increases in the coal mining industry and the industries directly affected, through increased productivity and through reduction in profit margins."

Pointing to the possibility that the coal settlement "could lead to a more or less general wage-price spiral," given certain developments, the President urged that "Until the coal situation clarifies further, steel producers and other manufacturers who mine or buy coal have a responsibility not to make decisions on price advances until the effect of the wage-price adjustments in coal have been determined by actual experience.

"This applies with particular force to industries such as the steel industry whose costs are much less affected than those of the coal industry by the recent coal settlement.

Urges Price Stability

"Viewing the profit margins in the steel industry, the certainty of high and increasing demand for many years, if we maintain maximum employment, and the financial strength of the industry, stability in steel prices would be a wise economic policy for this industry as well as for the country.

"The desirable economic results which flowed from pursuit of such a policy by the steel industry and other industries after wage adjustments during the first half of the year have been adequately demonstrated," he continued. "On the other hand, pursuit of a different policy now by the steel industry or by other industries even more remotely affected by the coal settlement could offset the progress thus far made and start another price-wage spiral in motion."

In the foreword of his report Mr. Truman said: "At midpoint 1947, we have surpassed previous high records of civilian production, and are now producing goods and services at a rate of $225 billion annually. Month by month there has been talk of recession; month by month recession has failed to materialize."

Irving S. Olds, chairman, United States Steel Corp., last week issued a statement in which he contended that the wage gains of the United Mine Workers were no more inflationary than the "substantially similar wage increase" given last spring to workers in other industries. He denied the coal wage contract was dictated by "Big Steel" or "Big Coal."

LIGHT JET: Weighing only 85 lb and developing 150 lb of thrust, this new Boeing Model 500 turbo-jet engine is believed to be the smallest of its type yet built. Developed by Boeing Aircraft Co., Seattle, the engine is adaptable to aircraft, missile or target plane use. Engine is 29 in. in length (minus tail pipe) and 22 in. in maximum diameter

Autoworkers To Test Labor Act Provisions

Campaign of defiance of section on endorsing of political candidates launched. Union to ignore new labor board

DETROIT

IN A studied campaign of defiance of the new Taft-Hartley Labor Act, the UAW-CIO automobile workers' union international leaders are inviting a test of provisions of the act prohibiting printed endorsement of political candidates.

Walter P. Reuther, president, issued an announcement in a union publication inviting prosecution for endorsing two congressional candidates with avowed CIO leanings. Punishment for violation of this section of the act is $1000 fine or one year's imprisonment for the official committing the violation and $5000 fine for the union he represents. Reuther said he was making the endorsement "with the deliberate and studied intention of challenging the constitutionality of the Taft-Hartley Act."

Also the UAW-CIO has announced it will in the future "refrain from calling upon the new National Labor Relations Board for any assistance whatsoever." This was the substance of the first of two resolutions adopted by the international's executive board. The second declared that local unions are henceforth without authority to negotiate contracts unless they contain clauses by which the employer agrees that in event of any alleged violation of contract on the part of the employees during the life of the agreement, there shall be no liability on the part of the international union, local union or any of its officers.

Won't Deal with New Board

In renouncing the services of the NLRB, the union said it would no longer request the board to certify it as a bargaining representative, to decertify any certified union, to certify authority to seek union security contract clauses, to rescind authorization previously granted for union security, or to consider charges of unfair labor practices against employers. Further, the UAW will resort to impartial agencies or persons other than the NLRB to conduct elections among employees to determine union preferences.

Reasons for the action are obvious. The UAW-CIO apparently realizes the new NLRB will no longer be the one-sided CIO-biased group it has appeared to be in past years. It is saying in effect, "If we are not sure we are going to win all the time, we won't play."

NLRB APPOINTEE: Robert N. Denham, above, has been appointed by President Truman to the new post of general counsel of the National Labor Relations Board. Also named to serve on the enlarged board were Abe Murdock, former Democratic senator from Utah, and J. Copeland Gray, former member of the War Stabilization Board. Reappointment to the board of Paul M. Herzog as chairman, John M. Houston and James J. Reynolds was also announced by the President. NEA photo

Referendum among UAW-CIO workers on the proposal to approve a merger with the farm equipment workers' union of the CIO, long suspected of being under communist control, showed the plan voted down by about 2 to 1, sustaining the position of Reuther and rejecting the urgings of the left-wing faction of the UAW executive board.

Union and U.S. Steel Hold Quarterly Labor Meeting

PITTSBURGH

Key officials of U. S. Steel Corp. and United Steelworkers of America recently held the first joint quarterly meeting here in conformity with the provisions of the recently adopted wage contract. More friendly and co-operative relationship between management and employees is the major aim of these scheduled quarterly meetings.

John A. Stephens, vice president, industrial relations, U. S. Steel Corp. of Delaware, noted that achievement of this goal depended on formation of proper attitudes between employees at all levels of responsibility in their respective organizations; and that these attitudes must be based on full understanding of and regard for not only the respective rights but the responsibilities as well of both the company and the union.

"These attitudes can be best encouraged when it is clear that the company and union officials are not anti-union nor anti-company, but are sincerely concerned with the best interests of the business and all employees," he said.

To assure that the purpose of the parties would not be prejudiced or impeded, it was agreed that the meetings shall not be for the purpose of conducting continuing collective bargaining negotiations nor to in any way modify, add to, or detract from the provisions of the agreement.

"Having defined the terms, we emerge into an area where the requirement is simply that we abide by those terms. It is this area with which we are now concerned," Mr. Stephens declared at the meeting.

Philip Murray, president, USW-CIO, expressed the hope that out of these quarterly meetings there will develop a better understanding and a broader and more accurate knowledge of the problems which confront the country.

Union Registration Office Set Up by Schwellenbach

Secretary of Labor Schwellenbach has established the Office for the Registration of Labor Organizations to exercise and perform the authority and functions specified in Title I of the Labor-Management Relations Act of 1947 in connection with filing of financial and organizational reports by local and national unions.

Labor Department officials estimate there are more than 150 international unions and between 50,000 and 75,000 local unions in this country.

The President has sent to the House a supplemental budget request for $333,100 to carry out the department's functions under the act for the rest of the fiscal year. The estimates include $144,900 to the Office of the Secretary for the union registration operations.

Some Gains Are Reported In Worker Productivity

Executives in two out of every five companies report production per employee is greater now than a year ago, according to a survey on personnel problems by the National Industrial Conference Board. A similar number declare production is about the same as a year ago and one in 10 asserts that employee output is either less than a year ago or "better in some departments and poorer in others."

Windows of Washington

By E. C. KREUTZBERG, *Washington Editor, STEEL*

Many members of Congress disturbed by labor union proposals to circumvent Taft-Hartley Labor Act. See threat to American free enterprise system in AFL's suggestion that far-flung system of labor-consumer co-operatives be organized

MANY members of Congress frankly were disappointed over the extent to which the provisions of the original Labor-Management Relations (Taft-Hartley) Act of 1947 had to be watered down in order to get sufficient support to insure overriding of the President's veto. In the debate over that measure many in both houses objected to the numerous compromises on the ground that softening of the bill's provisions would merely postpone the necessity of eventually putting a firm curb on the nation's labor leaders.

Since then a number of labor develoments have proved highly disturbing to these congressmen, and it is no exaggeration to say that a majority today feel the labor leaders still have much more power than is good for the welfare of the country.

It is not the spirit of defiance of the Taft-Hartley Act that arouses concern among legislators. The Wagner Act, it is recalled, was received in a similar mood. Like the Wagner Act, it generally is felt, the Taft-Hartley Act will be received as the law of the land through the usual route of court interpretations.

Labor's Proposals Cause Concern

Rather, legislators are disturbed over some brand-new proposals of the labor leaders—proposals which, if carried out, would destroy the whole American free enterprise system. Perhaps the most dangerous, because it rather easily could be put into practice, is one fathered by the usually conservative American Federation of Labor. The AFL has called on the 7,500,000 members of its component unions to organize a far-flung system of labor-consumer co-operatives "for producing and distributing the necessities of life." If this proposal actually were to be put into effect, it quickly would drive out of existence thousands of small businesses that live off profits earned in "producing and distributing the necessities of life."

Another development which has aroused considerable discussion among legislators is the performance put on by Music Czar Petrillo in his recent appearance before a subcommittee of the House Labor Committee, when he threatened, on the one hand, to put an end to piping of music programs to be broadcast over national radio hook-ups, and, on the other, to kill off the phonograph record industry by putting his union into the business of manufacturing records.

But the development that has aroused most discussion is the new 11-point program of the Congress of Industrial Organizations calling for nationalization of industry and business on a large scale. This CIO program is as follows:

1—Government agencies such as ICC, FTC and Justice should co-ordinate their anti-monopoly work.

2—Congress should give much more liberal appropriations for enforcing the antitrust laws.

3—Government aid should be made available to small business to the extent of subsidizing marginal producers.

4—In other cases, loans to small business should be available. Private banking houses control monopoly corporations and are therefore reluctant to lend money to small competing businesses. Government loans are therefore essential.

5—There should be a system of universal use and government control of patent rights.

6—Government research should be carried on extensively in all industrial fields with the assurance of unrestricted use in American industry of government patents resulting from such work.

7—Pilot plants might be set up in certain industries to force prices down to reasonable levels; that is, more extensive use of the experience gained through TVA.

8—Congress should give the Department of Justice the right to stop mergers resulting from large corporations acquiring the assets of small companies.

9—American corporations should be banned from entering cartel agreements, such as those entered into with I. G. Farben and others before the war.

10—In the light of present economic tendencies, it may become necessary to give serious consideration to public control, either through regulation or ownership, as a means of curbing monopoly practices.

11—It may be also necessary, in order to stop monopoly, to subject the major privately owned corporations to some type of government regulation.

When the Taft-Harley bill was under debate, labor leaders served notice that individual members of Congress, irrespective of anything they had done in the past, would write their records by their votes on that measure. As a result there now is less tendency to straddle or dodge issues in which labor leaders have an interest. Many of the legislators, fully aware that organized labor is going to fight them tooth and nail when they come up for re-election, feel they have nothing to lose, but possibly something to gain, from carrying the fight to labor now.

"The CIO program is nothing but camouflage for an attack on free enterprise," declares Rep. Walter C. Ploeser (Rep., Mo.). At present Mr. Ploeser, as chairman of the House Small Business Committee, is one of the important leaders in Congress. One of the men for whom labor will be gunning in 1948, he will need a lot of support if he is to continue on guard against attacks on the American private enterprise system in the future.

Some of the CIO proposals, Mr. Ploeser admits, are good. The good ones are those calling for larger appropriations for antitrust law enforcement, co-ordination of antitrust enforcement efforts of the agencies, for a law to control mergers and for a continuation of the thumbs-down attitude toward membership of American corporations in international cartels.

"But the CIO program in general," declares Mr. Ploeser, "is a guileful effort to blight capitalism under the guise of antitrust law enforcement. It says nothing about monopolistic practices of labor—like the closed union, limiting of the width of painters' brushes, the slowdown, padding of personnel, opposition to the introduction of more efficient technology, and industry-wide bargaining. Under a condition of competitive capital and monopolistic labor, capital would be at the total mercy of dictatorial labor leaders. Hence, labor's strategy in seeking to weaken capital through an enforcement of the antitrust laws."

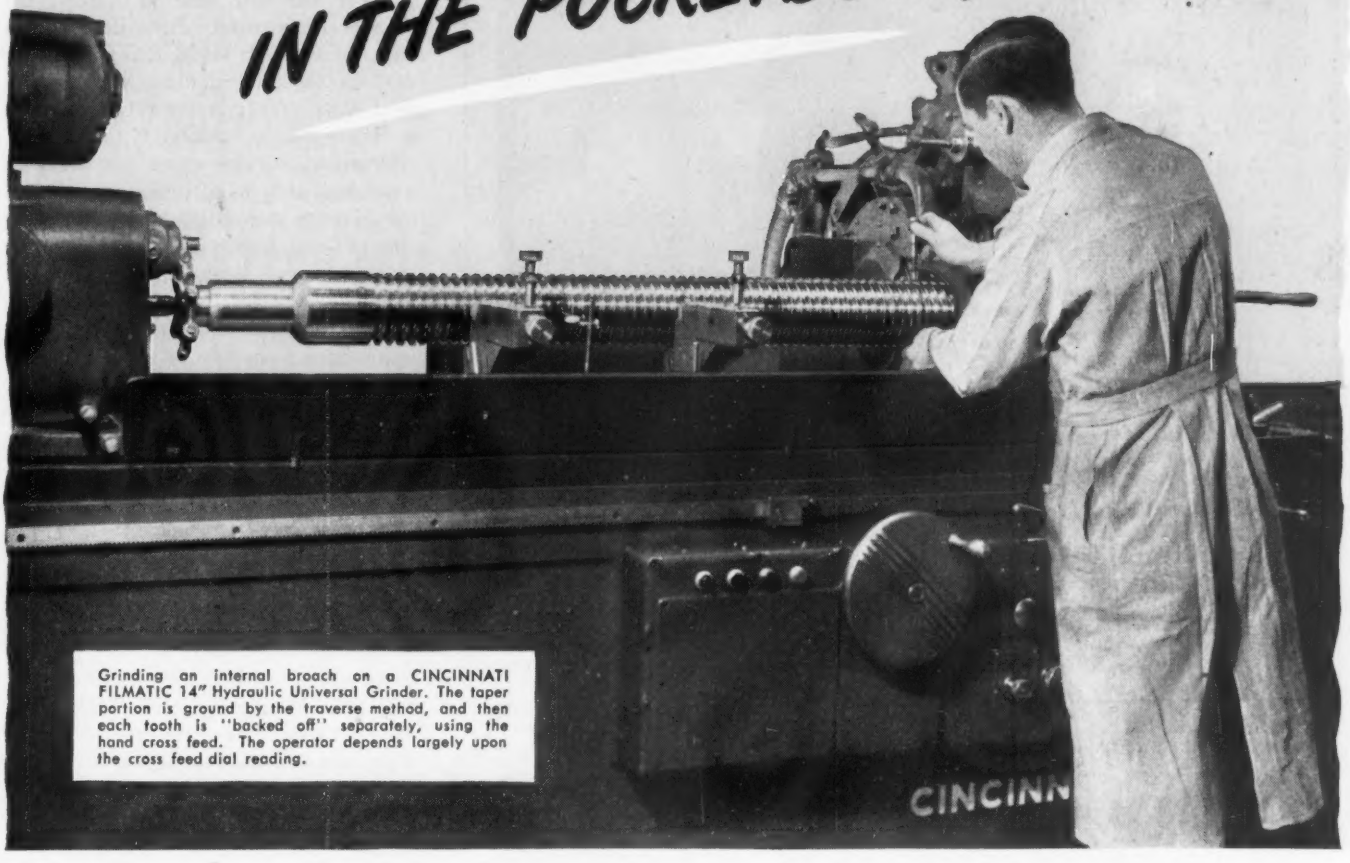
The hidden purpose in the CIO program, says Mr. Ploeser, is indicated by two proposals which advocate government ownership of industries. "If public ownership is the remedy for monopoly in business," he asks, "then what is the use of proposing a program for restoring competition?"

New Export Director

Under legislation just approved by Congress, David K. E. Bruce has been named to fill the new office of assistant to the secretary, Department of Commerce. His principal duty will be to chairman a new top-level interdepart-

Just think how a slip in grinding one tooth would hurt . . .

IN THE POCKETBOOK



Grinding an internal broach on a CINCINNATI FILMATIC 14" Hydraulic Universal Grinder. The taper portion is ground by the traverse method, and then each tooth is "backed off" separately, using the hand cross feed. The operator depends largely upon the cross feed dial reading.

Tailor-made parts manufactured in small quantities of say one to ten, and requiring several close tolerance grinding operations, afford an excellent test of the precision performance of the grinding machine. The internal broach being ground in the illustration above could very easily qualify as the daddy of all parts of this type as each tooth is ground separately. ¶A prominent broach manufacturer chose a CINCINNATI FILMATIC Hydraulic Universal Grinding Machine for the job, because he can depend upon sizing. This is an exceptionally important consideration, for there can be no second guessing in grinding these expensive parts. Each tooth must be accurately ground with respect to the next one. ¶CINCINNATI FILMATIC Hydraulic Universal Grinders have many features of value in precision toolroom grinding, such as FILMATIC Grinding Wheel Spindle Bearings; Infinitely Variable Headstock Speeds; hinged Internal Grinding Attachment, and others. Would you like to know more about them? Catalogs will be sent on request.

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FEARS COLLAPSE: Testifying before the Senate Economic Committee, Leon Henderson, wartime OPA chief, expresses fear the nation is threatened with "a repetition of the collapse which followed World War I," and urges Congress to take steps to head it off. At right is Paul A. Porter, who also served as OPA administrator. NEA photo

mental policy committee to have charge of the control of exports. The twofold object is to protect the domestic economy against undue drainage of scarce goods, and to fit our export policy into our overall foreign policy. The Policy Committee on Exports will function under Public Law 188, signed by President Truman on July 16 extending controls on 397 products until Mar. 31, 1948. These include petroleum and petroleum products, industrial chemicals, fertilizers, fats and oils, meats, coal, steel mill products, etc. It authorizes export priorities upon certification by the secretary of state.

Mr. Bruce, a graduate of Princeton University, class of 1916, is a lawyer by profession and has a long record of public service.

Ban Partially Removed

For the first time since 1912 the War Department appropriation bill, for the fiscal year ending June 30, 1948, has emerged from Congress without a provision prohibiting studies of jobs in War Department establishments "with a stop watch or other time-measuring device." In that year the late Senator Borah, after an extensive investigation, denounced time-study methods originated by the late Frederick W. Taylor as "vicious," "inhumane," and tending to "enslave" labor.

The War Department bill this year came from the House without the usual ban, and Sen. Warren G. Magnuson (Dem., Wash.) struggled valiantly to add it in the Senate. He lost out under opposition from Sen. Joseph Ball (Rep., Minn.). No general ban of this type, declared Senator Ball, can help improve efficiency in government establishments.

"Any firm of good industrial engineers trying to lay out a production program and a flow of materials in a plant must use a stop watch now and then in order to discover the most efficient way of performing a particular operation," said Senator Ball.

By one of those peculiar inconsistencies, the Navy continues under the ban. The Navy bill came out of the House Appropriations Committee without it, but on motion of a Massachusetts congressman it was added as usual. Thereafter it was retained in the bill as it eventually went to the White House. During the coming year, therefore, the War Department can conduct time studies if it desires, but that will continue to be taboo for the Navy.

When the Senate threw out the Magnuson amendment it also threw out the usual ban on use of incentive pay systems by the War Department. Whether the War Department will undertake the installation of such systems in the coming year remains to be decided. It also will be necessary to study the Civil Service rules to determine whether incentive pay systems are permissible under these rules.

Antitrust Enforcement

For the first time in history, the Justice Department Antitrust Division and the Federal Trade Commission are working together in enforcing the antitrust laws. This "reform" results from a House Small Business Committee investigation which revealed that the FTC has been postponing action against the tire industry since 1945 because of a desire to keep from treading on the toes of the Justice Antitrust Division. The FTC has launched an investigation to determine whether the tire industry has encouraged monopoly by the use of "unjustifiable" price concessions to mass purchasers. If resulting evidence warrants the commission will institute action "to prevent price discounts that are promotive of monopoly." Justice and FTC officials have assured the House Small Business Committee the same co-operative tactics hereafter will be employed.

Still Behind Schedule

Patent Office officials are building up their examining personnel. The staff in March of this year consisted of 65 primary and 594 assistant examiners; by recruitment now under way it hopes to expand this by next June 30 to 66 primary examiners and 985 assistant examiners. But it will take a long time before the enlarged staff gives a good account of its efforts—for it takes one to three years for a new man to become productive.

In the meantime, not only because of shortage of examiners but because of the sharp increase in patent application receipts since V-J Day, the office continues to fall behind. On Dec. 31, 1946, the backlog of applications was 184,000. Today it is over 200,000.

In seeking to employ new examiners, the Patent Office is especially desirous of interesting electrical, mechanical and chemical engineers.

Apprenticeship Committee

The following industrialists are members of the Federal Committee on Apprenticeship, appointed by Secretary of Labor Schwellenbach: William L. Batt, president, SKF Industries Inc., Philadelphia; A. A. Pierson, director of training, Ford Motor Co., Dearborn; Claude Putnam, president and treasurer, Markem Machine Co. and F. A. Putnam Mfg. Co., Keene, N. H.; F. L. Rayfield, president, Potter & Rayfield Inc., Atlanta.

Discounts Specter of Depletion In U. S. Metal, Mineral Reserves

Howard I. Young, president of American Zinc, Lead & Smelting Co., says America not likely to become a "have not" nation in regard to those resources we had in abundance prior to the recent war

THIS IS not a "have-not" nation so far as metals and minerals are concerned—nor is it likely to become such.

Howard I. Young, president, American Zinc, Lead & Smelting Co., expressed this belief in an address given recently in St. Louis, in which he expressed confidence that "with a continuation of good prices for metal products and sufficient manpower to carry on mining and development, the mining industry will continue to supply the major part of the requirements of the United States for copper, lead, zinc, iron ores, and other minerals and metals that we have supplied in substantial quantities prior to World War II. With government policies that will continue to create confidence, I am sure that more venture capital will be available for the development and production of our mineral resources."

He pointed out that the Bureau of Mines and the Geological Survey estimate sufficient reserves of iron ore for 111 years, molybdenum 422 years, sulphur 55 years, copper 34 years, lead 12 years, zinc 19 years, vanadium 7 years, and cadmium 16 years.

Some Minerals Remain Scarce

Mr. Young said that we always have been a "have-not" nation in tin, nickel, chromite, asbestos and industrial diamonds and we depend upon foreign sources for most of our supply of manganese, tungsten, and mercury.

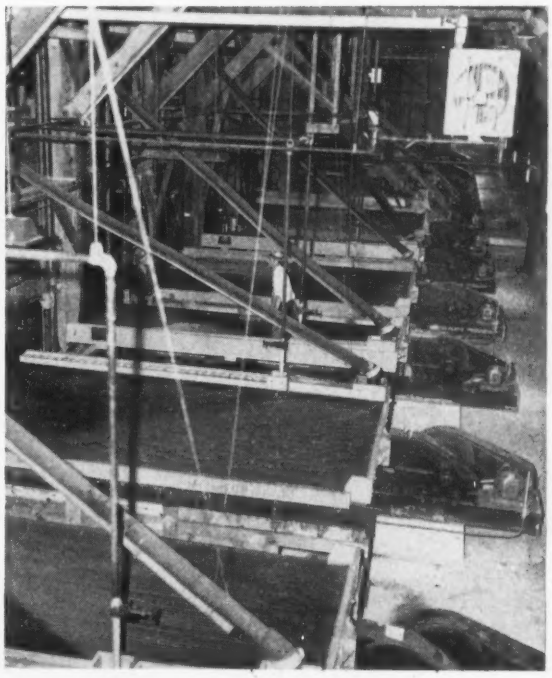
Since economics governs the amount of money a mining company can invest in mine development work for the purpose of maintaining sufficient blocked-out ore reserves to assure continuous mine production, it is understandable why it is impossible for any one to say that we have a certain number of years reserves of different metals. He pointed out that increased prices bring into the commercial classification of reserves substantial tonnages that could not be considered as commercial ore at lower prices. Mining and smelting costs increased during the war an average of around 85 per cent. Labor costs increased in excess of 100 per cent. "Higher costs will, no doubt, continue for many years," Mr. Young said. "Therefore, it will be necessary that the price level of metals remains high enough to return a sufficient margin of profit to justify the investment of venture capital in the further development of our minerals and metals."

Manpower is another factor that has materially influenced the production and development of our critical materials in the past few years. "It is my judgment," he said, "that had there been adequate labor available for the copper, lead and zinc mines during the war to maintain normal development and, at the same time, operate all mines at capacity, we would not have experienced the shortage of metal that has developed (particularly in copper and lead) within the last year. Labor strikes during the first half of 1946 greatly reduced the metal production from the majority of the large producing domestic mines."

In Mr. Young's opinion, it will require several years before development in our domestic mines and the mines in the world have reached a point where maximum production from all properties can be maintained. It is the judgment of those best qualified in the mining industry that through the application of geophysical prospecting many new ore deposits will be found in the future in the presently known mineralized areas and that through intelligent development work and with adequate metal prices there will be developed enough new mines to replace those that are being worked out.

To substantiate the argument that we are not becoming a "have-not" nation, Mr. Young said that we produced during the war years 69 per cent of the total bauxite used during that period whereas normally we depend on foreign sources for our supply.

"Much has been said regarding the depletion of our iron ore reserves," Mr. Young continued. "The largest section producing iron ore in the United States is known as the Mesabi Range. Here are enormous iron ore reserves. The major part of these reserves, however, are in the deep mines, the ratio being approximately 66 per cent in the shaft mines and 34 per cent in the open pit mines. During the war it was necessary, in order to conserve manpower, to draw heavily on the open pit reserves. About 60 per cent of the total production of iron ores came from the open pit mines and 40 per cent from the underground mines. The Mesabi Range will produce enormous tonnages for many years. The industry recognizes the necessity of improved beneficiation of the lower grade ores and increased mining costs of the deeper deposits. It is estimated that around $900 million will be spent on improvements alone for the purpose of beneficiating low grade ores and mining the deeper ores."



HISTORIC ORE: The iron mines at Ringwood, N. J., which produced ore for weapons used by George Washington's forces in the Revolutionary War, have been reopened by their new owner, who recently bought them from War Assets Administration. At right is a view of their modern table concentration room where 24 tables wash the ore. NEA photo

Coal Shortage in France Restricts Steel Production

Miners' strike settled, but fuel lack limits output to two-thirds of capacity. Imports of steel large

PARIS, FRANCE

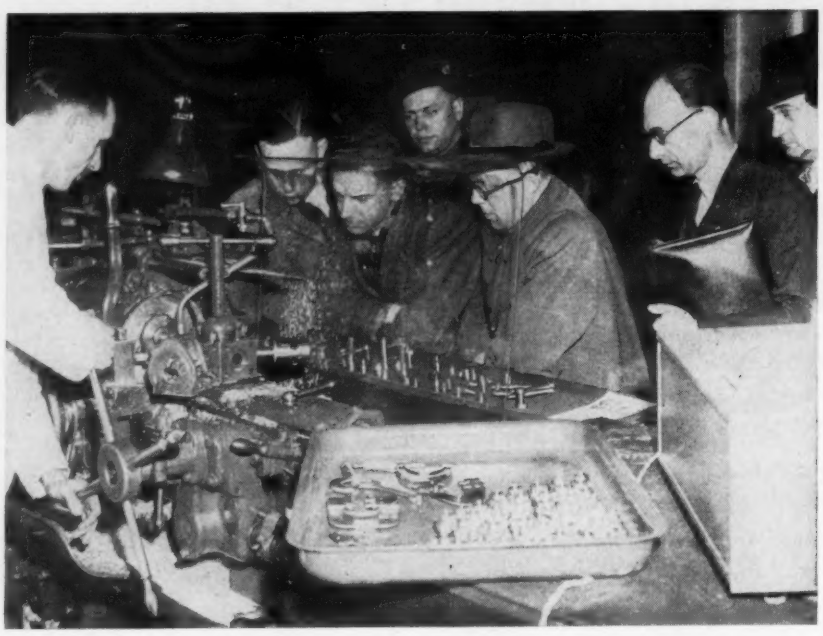
PROMPT settlement of the French coal strike following a four-day walkout was made recently with the miners accepting a 35 franc (29 cent) daily wage increase and a supplementary bonus based on individual output. Union leaders had demanded a flat daily increase of 60 francs (50 cents). The Citroen automotive works strike is still on, however, and a fresh strike of civil servants is again threatened. The decision of the Socialist party to stop collaborating with the communists, it is feared, may in time result in a general strike.

French steel production now seems to have reached a ceiling which is about one-third below capacity. Holding down output is the shortage of coal.

Because of the lower steel production, France, contrary to its prewar position, has become a substantial importer of steel products. In the first three months of 1947, for example, imports were as follows: January, 27,000 metric tons; February, 53,000 metric tons; and March, 55,000 metric tons. Exports for the same months were 11,300 tons, 13,800 tons and 19,500 tons, respectively. In contrast, monthly average imports in 1938 were 6000 metric tons and exports, 128,000 metric tons. Almost all the tonnage currently exported is consigned to French overseas territory.

Output Compares Well with Prewar

Production of pig iron and ferroalloys in May reached the highest level since the liberation with output of 428,000 metric tons. This represents 85 per cent of the average output of 1938 and an advance of 70 per cent over the May, 1946, figure. The production of steel ingots and castings in May came close to the 1938 average with 508,000 tons. In particular, the output of basic bessemer steel in May was 93 per cent of the average monthly production of 1938; output of open-hearth steel was 100 per cent of the 1938 average, and electric steel production was 150 per cent of the prewar figure. Production of rolled steel was slightly less at 95 per cent of the 1938 average instead of 102 per cent last April. The number of blast furnaces in operation increased by one in April, bringing the total in blast to 66 against 86 at the end of 1938. The number of workers employed in steel plants also increased in April, reaching 114,300 at the end of the month, against 113,800 at the end of March and an average of 140,000 in 1938.



AT ENGLISH FAIR: Turret lathe operator produces threaded, multi-diameter parts from bar stock in hand-operated lathe which holds to close tolerances and operates at high speed at British Industries Fair

Automobile production declined in May as a result of the strike at the Renault factories and a general slowdown movement in a number of plants producing spare parts. May output was 10,198 units—comprising 5122 private cars, 4720 commercial vehicles and 356 other vehicles—compared with 13,292 produced in April.

Trade between France and the United States in May amounted to $101 million of imports against $3,100,000 for exports from France. For the first five months of the year exports from France to the United States were $22,900,000, and imports in the Franco-American trade were valued at approximately $282 million.

An agreement was signed some months ago between France and Poland, according to which 100,000 metric tons of Polish coal were to be delivered monthly to France in exchange for French electrical equipment. Recently, however, Poland stopped coal shipments, the reason given being that France had not yet begun its deliveries. The French contend the coal received from Poland was inferior in quality and that deliveries reached only 60,000 tons a month instead of 100,000, and further that Poland is requesting payment in dollars. In addition, although several Polish missions have visited France, the French say that no precise specifications for the electrical equipment have been given and that no regular orders have been placed.

French iron ore mines extracted 16,276,037 metric tons in 1946, as against 7,692,709 tons in 1945, 37,850,177 in 1937 and 50,731,000 tons in 1929. In 1946 the home market received 8,238,461 tons, and 5,488,558 tons were exported, Belgium and Luxemburg receiving some 50 per cent of their prewar imports. The financial situation of the French iron mines is unsatisfactory; costs increased by 45 per cent between January and December, 1946, without a corresponding increase in the sales price. Accumulated losses for the Lorraine district since 1943 amount to 1.7 billion francs ($14,166,000). An expert has been appointed by the French government to investigate the cost situation for the iron ore industry and his report is expected soon.

British Steel Output Rate Rises in Second Quarter

British production of steel ingots and castings in the second quarter of 1947 was at an annual rate of 12,694,000 tons, compared with a rate of 11,231,000 tons in the first quarter and 13,111,000 tons in the corresponding quarter of 1946, according to the British Iron & Steel Federation.

The higher rate of steel output in recent months, however, has been achieved only at the expense of continued withdrawals from stocks of pig iron and steelmaking materials. Maintenance or increase in the level of steel operations

will depend on the availability of increased supplies of coal.

Average weekly figures for production of steel ingots and castings in 1947 were as follows: First quarter, 216,000 tons; second quarter, 244,100 tons. Figures for the comparable periods of 1946 were 242,600 and 252,100 tons, respectively.

Pig iron production in 1947 averaged 134,400 tons weekly in the first quarter, against 145,500 weekly in the first quarter of 1946. Overall second quarter average was 141,600 tons in 1947, against 150,500 tons in 1946.

Iron & Steel Committee Will Meet in Sweden

Second meeting of the Iron & Steel Committee, International Labor Office, is to be held at Stockholm, Sweden, Aug. 19-Sept. 3, inclusive, and names of the American delegation will be announced shortly by President Truman. The agenda calls for discussion under these four heads:

1—Matters left over from the first meeting, held at Cleveland in April, 1946. One of the principal subjects is the mapping out of ways and means for persuading other countries to publish iron and steel production statistics comparable to those published in the United States.

2—Regularization, if possible, of production and employment by the industry at a high level.

3—Minimum income security for the workers, particularly through annual and other wage systems for assuring earnings.

4—Labor-management problems of the industry.

Fourteen countries will be represented at the Stockholm meeting.

OTS Report on 60 German Welding Electrodes Issued

Specifications for more than 60 German welding electrodes are included in a report on arc welding which has been published by the Office of Technical Services, Department of Commerce. Written by investigators for the British Intelligence Objectives Subcommittee, the report describes testing procedures employed by the Germans for the electrodes and lists specifications for austenitic electrodes for armor and alloy steel, special ferritic electrodes for armor, hard surfacing electrodes, mild steel and low-alloy high tensile steel electrodes and special purpose electrodes.

According to the investigators, the German electrodes, while in many cases modifications of American and British conventional types, were inferior to Anglo-American products and, with the exception of those made by Krupp, were not subjected to standardized tests.

Upward Revision of German Steel Prices Now Under Consideration

Prices which were established during the early days of the depression fail to take into account present low operating rate, high cost of production with low-grade domestic ores. Socialism feared if industry continues to operate in red

DUESSELDORF, GERMANY

UPWARD revision of German steel prices is regarded as one of the most critical issues facing the German steel industry today. Seeking to keep the price of steel at the low level where it has remained since the depression days of the early 1930s are advocates of state socialism, who, it seems, think that if steel prices are kept low and government subsidies to the industry continue to be paid they can eventually convince the public of the need for socializing the industry.

The present low steel prices are an inheritance from the Hitler period which gave the industry a terrific production boom, but granted no price increases. Prices have remained at the level to which they were cut in 1933. Iron bars, for example, are frozen at 110 reichsmarks ($11) a ton, fob Oberhausen. When production costs began to show a world-wide rising trend after 1937, the industry was given no relief, although no unused capacity was left to serve as a compensating factor. Action by the Nazi government requiring a higher consumption of low-grade domestic ore, substitution of pig iron for scrap in open-hearth processes plus enforced contributions to the state forced the industry to operate at a loss.

During the war, steel continued to be produced at a loss, and only through operation of highly integrated facilities were many of the companies able to continue production. The highly finished and specially processed steels were better priced and profit from these steels were able to compensate for losses incurred by blast and open-hearth furnaces and rolling mills. Steel exports also showed profits.

In the postwar period no such compensating elements are left. Exports have been largely eliminated and output of special steels has been sharply curtailed. Steel processing facilities which have been left with primary producers no longer show profits. These factors impelled the industry in the spring of 1946 to apply for an increase of 64 RM per ton of ingot steel and similar increases for various rolling mill products. The validity of the need for the increase was confirmed at that time by an official commission.

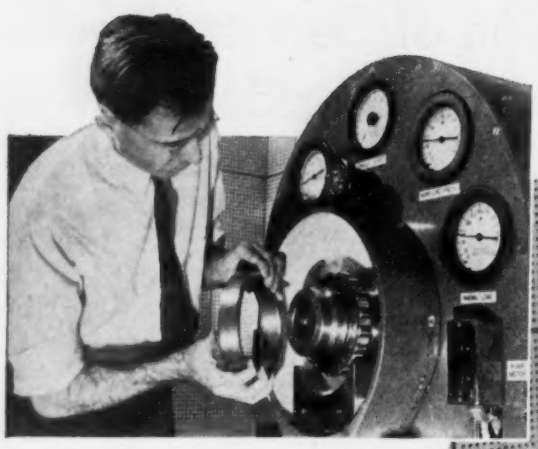
Indicative of the way "fixed" costs have risen during the last two years are the findings by a group of accountants who have determined that fixed costs have increased from 34 per cent of total production costs to 40 per cent. In addition it has been determined that costs of operating plants at less than capacity soar upward until at 20 per cent of capacity, at which rate many plants now operate, the additional costs are equal to current quotations for steel. Thus, the cost of manufacture is double the sales price.

In spite of the urgency of the price problem, the application for higher prices was shelved for nearly a year by the German administration and only recently has it been presented to the Allied Control Council, which will decide on its merits. Before the application was forwarded to the Allied government authority, however, a downward revision of about 11.5 RM was made on the proposed advance. Merchant bars, for example, would rise under the changed application from 115 RM (including a freight charge of 5 RM) to about 180 RM; standard rails would rise by 70 RM, merchant pipe by 76 RM and steel sheets by 80.30 RM. Well informed steel industry sources expect the council will not grant outright the increases which have been applied for, but instead will give only a partial increase and will continue the subsidies.

Subsidies Paid New Firms

These subsidies, incidentally, are paid to the newly established "deconcentrated" steel plants which have been detached from parent companies.

Meanwhile, three additional independent steel companies have been established by the Custodian Office. These plants — now known as Gusstahlwerk Witten A. G., Gusstahlwerk Gelsenkirchen A. G. and Gusstahlwerk Oberkassel A. G.—were taken from the Ruhrstal A. G., an affiliate of Vereinigte Stahlwerke A. G. Their setup is similar to that of the four companies established in February. Management is shared by three directors—one for technical affairs, one for business and one for workers' affairs. Each of the new companies is capitalized at 100,000 RM ($10,000), which, in view of the large losses incurred every month, makes its business dealings precarious.



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HYATT ROLLER BEARINGS

Mirrors of Motordom

Blueprint of a better economy for U.S. calls for increased industrial production, reduction in the federal debt, slashing of tax rates and establishment of a free gold market, in opinion of Willys-Overland president

By JAMES D. MOONEY
President and Board Chairman
Willys-Overland Motors

GUEST EDITOR

Three top-flight automotive and automobile parts authorities have accepted STEEL's invitation to serve as guest editors of Mirrors of Motordom while Detroit Editor A. H. Allen is on vacation. The first is presented herewith. James D. Mooney, for many years prior to the war head of General Motors overseas operations, a recognized authority on world economics and trade, and for the past year and a half president and board chairman of Willys-Overland Motors, outlines some of the steps he feels should be taken to stabilize the U. S. economy and assure continued prosperity.

JAMES D. MOONEY

IN THE MINDS of the majority of Americans today, the present state of our economy leaves much to be desired. Prices are too high, quality goods are too scarce, there is a feeling of unrest as to what the future may bring. As a nation, we would like to get out of the economic clouds and feel that our feet were once again on solid ground.

As a starter, we must do four things to shake ourselves down. They are (1) Increase production; (2) reduce the federal debt; (3) reduce the tax rates; and (4) establish a free gold market.

There is no way to increase wealth except through production. There is no road to prosperity except work. For everybody to have more, we must get on the job of making more. It is as simple as that. Here we are facing the greatest pent-up demand for all kinds of goods that we have ever had offered us, and we waste a lot of time arguing with each other. The whole world is looking for American goods—telling us to get to work and start producing as we never did before. Now, with a chance to work, not for war and destruction, but for national prosperity, we have every reason to get on with the job.

Debt Reduction Essential

An earnest effort to increase production, aside from its own benefits, will also be beneficial in helping to accomplish the second objective, that of reducing the federal debt. As matters stand now, the war debt alone is a first mortgage of $6000 against every family in this country. We can not hide our heads in the sand about the federal debt. Sooner or later we have to face the fact the federal budget should be balanced so we can start paying off what we owe. It is usually profitable to do the unpleasant thing first and the nicer ones afterward, and the same principle can be applied to this problem.

Because our indebtedness is so great, it is difficult to expect our federal government to reduce its income. On the other hand, industrial health is seriously impaired by the requirement of so high a proportion of cash outlay for taxes. Particularly so because now that we are well along in the reconversion period, an era of expansion lies ahead. Present capital reserves will be strained to finance it. Industry is faced with real problems of long-deferred plant maintenance. The current dependence is on prewar plants which are geared to a production rate from one-third to one-half lower than the rate in prospect. All told, as I see it, there will be considerable drain on assets.

The solution to many of these problems lies in the surpluses, reserves and future retention of profit by the corporations. Upon analysis, few corporations have what may be termed a position of "excess liquidity." The ratio of cash to sales has not risen. The *National City Bank Monthly Letter* of March, 1947, has an analysis of the balance sheets of 130 manufacturing corporations having sales or total assets over $5 million which indicates that for the period December, 1940, to December, 1946, the ratio of current assets to current liabilities declined. This would imply that many of the new resources accumulated during the war period are needed even now to support the current levels of business, and that in many cases, capital and cash positions are none too strong.

In view of these obstacles, the present tax program is definitely not designed to lend a helping hand to the corporation when it is most needed. Corporate taxes have risen from 19 per cent in 1939 to 38 per cent at present. These current taxes are not payable by corporations in raw materials, notes receivable or finished products. They are payable in cash. This means that four times a year the management of the corporation must arrange the finances of the corporation to meet the tax bill.

Many individuals have advocated continuance of high tax rates in order to

Automobile Production

Passenger Cars and Trucks—U. S. and Canada

Estimates by Ward's Automotive Reports

	1947	1946
January	373,872	126,082
February	399,717	84,109
March	441,793	140,738
April	449,388	248,108
May	390,629	247,620
June	418,919	216,637
July	388,000*	331,000
August		359,111
September		342,969
October		410,510
November		380,664
December		380,908
12 ms.		3,268,456

* Preliminary.

Estimates for week ended:

July 5	63,460	45,155
July 12	90,075	74,015
July 19	102,630	80,895
July 28	76,000	84,720

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HARD CASH: Ford Motor Co. workers at Rogue plant line up beside company pay truck to claim their wages. One of the few large organizations that pays employees in cash, Ford has its own armored trucks to transport its payroll. NEA photo

reduce the national debt and combat inflation. Let us, for a moment, take a look at this theory. In view of the rising cost of living and high taxes, management has had to increase wages of working people in an attempt to maintain their purchasing power. This has done nothing more than increase the cost of manufactured products, which, when added to the high tax burden imposed upon corporations, has made it necessary for the manufacturer to raise the selling price of his product to cover the increased cost.

Although the theory seems all right at first, sooner or later the inexorable law of supply and demand will take effect. As the price of an article gets higher, the demand decreases, production decreases, unit costs increase and so on until either the manufacturer is forced out of business or somehow is able to reduce his costs to the point where he can sell his product at a price where there is again a demand for it.

It is my opinion that by reducing the corporate tax burden substantially at the present time, the inflationary spiral will be broken. A manufacturer, because of decreased cost, then will be able to lower selling prices and consequently increase his production and distribution.

Would reduction of tax rates tend to increase, or at least hold constant, our national debt which, for sound economy, should be decreased? The law of supply and demand is not limited to products, but applies equally to money. By increasing production, we would provide more employment and in providing more employment, pay out more dollars which would be subject to federal tax based on income.

In all probability, although the rate of taxation would be lower, we would actually receive more dollars in taxes than under the present high rate of taxation. This basic law of supply and demand is recognized throughout industry. Experience shows that when we reduce the rate of income for each product we sell, we take in more dollars of income through increasing volume. Present high rates, on the other hand, set the law of diminishing returns in motion.

My main point is that, at present, we are confusing rates of taxes with dollars of taxes. It has been proved in industry and applies equally well to taxes that a reduction in rate increases rather than decreases the actual dollar return.

My final suggestion is that we establish a free auction market for gold in some important financial center in this country. This idea is prompted by the fact that the peoples of the world today, including ourselves, are living in an era of "funny" money.

A dollar, for instance, will not buy a dollar's worth. A pound will not buy a pound's worth, nor a franc a franc's worth, nor will a lira, a zloty or a piaster buy their worth.

The reason is that the monies of the world are largely artificially pegged at values which do not allow for the fluctuations which keep the money at its true value.

For instance, American soldiers in France, during the war, were paid in French francs which were artificially pegged at the rate of 2 cents to the franc. In the French economy, the franc was equal to ¼ of a cent. An average price for a glass of cognac was 60 francs. Converted, this means that the native paid 15 cents for his cognac, whereas the American paid $1.20. The result of this, as far as the Americans were concerned, was a flourishing black market.

Money, in the economic sense, is the common denominator for all values. It is sheer nonsense to think that all commodities will find their true economic level in terms of money while gold is pegged at an arbitrary price, unless dollars are freely convertible into gold at that price. We cannot, in short, have free markets for commodities unless we have a free market for gold.

A free market, where any money in the world can be bought and sold in terms of gold or dollars for exactly what it is worth would take the false ring out of the coins of the world. Price flurries might result, but they would be good because they would be the first proof that we had established honest relationships between money and gold on the one hand and between money and products on the other.

We can well afford to get on with the basic job of restoring an honest monetary system as the beginning of a new and brighter era of real, not make-believe, prosperity for all.

Cleveland Program Reactivated

The proposed Chevrolet-Cleveland plant, once scheduled to be the home of a new light-weight passenger car which project has since been liquidated after expenditure of a reported $17 million, has taken a new lease on life with announcement that work on the plant would be resumed immediately to provide 1,325,000 sq ft of floor space for manufacture of a variety of parts to supply assembly plants and service parts warehouses throughout the country.

Full-scale operations will require a working force of 5000 and production should be under way within a year. Addition of this large parts manufacturing facility does not mark any important change in Chevrolet's policy of parts buying on the outside; rather it is a matter of balancing out production facilities with expanded assembly operations.

Equipment needs of the plant probably will be substantial, although as yet not fully determined. A principal product will be sheet metal parts, presaging the requirement for presses, shears, brakes, welding equipment and the like. Some machinery doubtless will be moved from other plants in which it now operates, although in a plant of this size it is certain a considerable volume of new units will be required.

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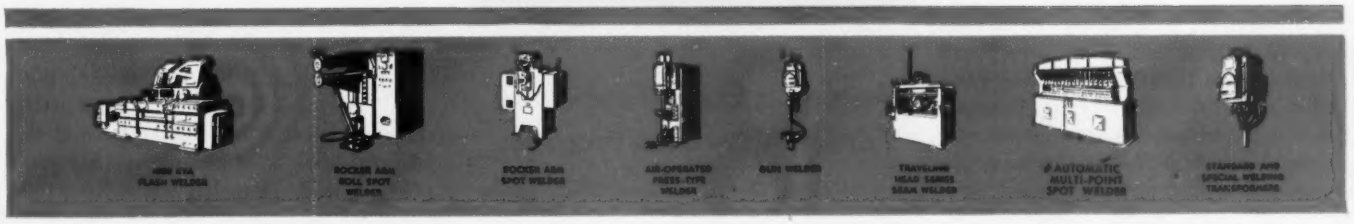


A.C.F. Reports Order Backlog Of $250 Million

Company reveals growing backlog despite deliveries in fair volume. Scarcities still hamper operations

AMERICAN Car & Foundry Co., New York, and its subsidiaries have an order backlog of more than $250 million, Charles J. Hardy, chairman of the board, revealed last week in reporting on the firm's position in conjunction with its financial report for the fiscal year ended Apr. 30.

Mr. Hardy told stockholders that the fiscal year closed with business on books in excess of $229 million and that since Apr. 30 this backlog has risen to over $250 million, "notwithstanding the deliveries, in fair volume, that have been made since the close of the year against business on the books at that date."

In discussing the company's domestic business, Mr. Hardy said that supply problems were easier but that scarcities were still plaguing his firm's operations. He could see no lessening in demand for railroad products in even the fairly distant future. Foreign needs, he declared, are expected to increase gradually as the world situation settles to a greater degree of normality.

Gross sales and car rentals, less discounts, the fiscal report showed, aggregated $132,820,244 for the year ended Apr. 30, compared with $118,113,552 in the previous 12 months. Profits for the recent year were $5,176,042, against $5,346,689 for the year before.

GOSH! IT WORKS: The rapt expression on face of little Leroy Van Herben, nearest camera, was caught as he watched his uncle, Wilbur Wade, check operation of a gas water heater during open house by Rheem Mfg. Co. at South Gate, Calif., for stockholders and friends and relatives of employees. NEA photo

Carnegie Lets Contract For 5 Large Turbo Blowers

Carnegie-Illinois Steel Corp. recently awarded the Machinery Division of Dravo Corp., a contract for 5 large blast furnace turbo blowers, in connection with company's expansion program at its Chicago Works. These blowers will be used on new blast furnaces at the Chicago plant, each with a 28 ft hearth.

The blast furnace turbo blowers will be built by De Laval Steam Turbine Co., Trenton, N. J. Each will have a capacity of 110,000 cfm of air which can be delivered to the blast furnace at pressures up to 30 pounds gage pressure. The steam turbines driving the blowers will each read at 12,000 hp and are designed to operate at high speed pressure and temperatures. The turbines will be of the condensing type with a provision for bleeding steam from several stages for feed water heating. Delivery on this equipment is expected next year.

AAF Contracts To Have 72 Wasp Engines Overhauled

Official authorization to begin conversion and overhaul of 72 Wasp Major engines for Army Air Forces has been received by Pratt & Whitney Aircraft Division of United Aircraft Corp., Hartford, Conn.

Work on the engines will constitute the largest single job of its kind ever undertaken at the company's overhauling shop. The conversion of these old power plants will result in a saving to the Army of more than $4 million. Pratt & Whitney will receive over $1,500,000 for the project.

The engines, now rated at 3000 hp each, will develop 3500 hp upon completion of the job and will be identical with the latest model Wasp Major currently in production at Pratt & Whitney's plant in Hartford.

Aeroquip Corp. Inaugurates Family Allowance Program

Aeroquip Corp., Jackson, Mich., manufacturer of couplings, fittings and hose, has inaugurated a family allowance plan applicable to all its salaried employees with a base salary of less than $300 per month and with at least six months' continuous service.

The plan allows $10 per month for wife or fully dependent husband, $5 per month for each dependent child under 18 years of age with a maximum allowance of $25 per month. The company started the program because of increased costs of living and because it wished to "encourage younger employees to take on marital responsibilities, in that such responsibilities lend a stabilizing influence to the employee, the company and community."

Hanna Begins Ore Mining Project in South Minnesota

M. A. Hanna Co., Cleveland, has begun operation on an iron ore mining project in Fillmore county in southern Minnesota.

Twice before mining was started in this area, but only recently was it considered practical to mine the marginal product on a commercial basis, Leo T. Kreuz, superintendent for Hanna, explained. He said that two 40-acre sections are now being worked, and that 10 other areas under lease or option will be mined later. The general mining program is expected to last for at least two years, he said.

BRIEFS . . . .

Paragraph mentions of developments of interest and significance within the metalworking industry

American Rolling Mill Co., Middletown, O., has appointed J. M. Tull Metal & Supply Co. Inc., Atlanta, as distributor for its stainless steel sheets, plates, bars, wire and rolled stainless steel angles.

—o—

Package Goods Division, Chicago, Precision Steel Warehouse Inc., has added ground flat stock, packaged for convenience in handling, to its line of packaged brass and steel shim, feeler gage stock and drill rods.

—o—

Lucas Machine Tool Co., Cleveland, has moved to its 75,000-sq ft plant at 12302 Kirby Ave. Firm manufactures horizontal boring, drilling and milling machines.

—o—

Federal Trade Commission, Washington, has established a Trade-Mark Division to perform duties assigned the Commission by the Lanham Trade-Mark Act, which became effective July 5. Edward W. Thomerson, attorney on the commission's staff since 1934, will be in charge.

—o—

War Assets Administration, Cleveland, is offering for sale or lease a chemical plant in Fostoria, O. Built during the war at a cost of $1,218,000, the facility consists of two major and 26 supplemental buildings with a total floor space of 106,143 sq ft. Former bids for the facility have been rejected.

—o—

Brook & Perkins Inc., Detroit, fabricator of magnesium parts and products, has been reorganized as a corporation. Formerly a partnership, the firm will continue at the same location with E. Howard Perkins as president.

—o—

Lyon-Raymond Corp., Greene, N. Y., manufacturer of materials handling equipment, recently held an open house to celebrate completion of 25 years with George C. Raymond as president of the company. This year also marks the firm's 60th year of incorporation and 107th year of manufacturing record.

—o—

Bendix Home Appliance Inc., South Bend, Ind., announces that it built 296,000 automatic washing machines during the first half of this year, or more than its entire 1946 production.

—o—

E. I. du Pont de Nemours & Co. Inc., Wilmington, Del., announces that it was owned by 91,538 different stockholders as of June 30, an increase of 3764 over the number of holders recorded at the close of the first quarter of 1947.

—o—

Kaiser-Frazer Corp., Willow Run, Mich., has announced that it will not open its plant at Long Beach, Calif., until the Willow Run plant produces 1000 cars a day.

—o—

Wade-Morrison Co., Cleveland, newly formed, has begun production of conveyor chains.

—o—

Boeing Aircraft Co., Seattle, has developed two gas turbine engines as the result of a propulsion research project started in 1943. One engine weighs 85 pounds and the other 140.

—o—

Apex Electrical Mfg. Co., Cleveland, maker of washing machines, vacuum cleaners and ironers, announces that it had a perfect safety record during June when no time was lost due to accidents in the Cleveland and Sandusky plants during 462,325 exposure hours.

—o—

Heald Machine Co., Worcester, Mass., manufacturer of machine tools, has introduced a new trade-mark, which the firm plans to use as the motif for its exhibit at the Machine Tool Show in Chicago this fall.

—o—

American Rockwool Co., Chicago, has purchased a de-tinning plant in Birmingham from WAA for $120,000. The firm will spend $150,000 for reconversion and plans to produce insulating rock wool from Alabama slag when alterations are completed next April.

—o—

Gruen Watch Co., Cincinnati, has purchased a manufacturing plant at Mt. Vernon, N. Y.

—o—

Whitewater Centrifugal Casting Co. has changed its name to Wisconsin Centrifugal Foundry Inc. and has moved from Whitewater, Wis., to 905 E. St. Paul Ave., Waukesha, Wis.

—o—

Industrial Products Sales Co., Akron, newly formed, will act as manufacturer's agent for forging, iron and steel castings, stampings, screw machine products, stamped and cast industrial wheels and plastics related to the metal industry.

—o—

United States Rubber Co., New York, announces development of an electric cable to aid in the prevention of coal mine explosions. The cable consists of a fine strand of copper wire embedded between inner and outer layers of insulation. In the event of damage to insulation, the wire catches incipient current leakage before an arc can occur.

—o—

Acme Foundry Co., Detroit, has opened its new foundry which has increased capacity and can handle a heavier type of work than formerly with new crane facilities. Location remains at 2503 22nd St.

—o—

General Electric Co., Schenectady, N. Y., has released a 25-minute sound slide film in color entitled "Infrared Lamps for Better Production" which describes the different kinds of infrared radiant energy and demonstrates how this energy may be applied to industrial production.

—o—

Wheeling Corrugating Co., Wheeling, W. Va., subsidiary of Wheeling Steel Corp., has completed a new warehouse in Louisville, Ky., at 1424-36 S. 15th St.

—o—

Westinghouse Electric Corp., Pittsburgh, has finished building a 108,000 kw generator—the size of a six-room house—which will be used at Grand Coulee Dam to increase its generating capacity by an equivalent of 146,000 hp.

—o—

Sennett Steel Corp., warehouse steel distributor, is now occupying its new warehouse at 1300 Channing Ave., Detroit.

—o—

Oldsmobile Division, Detroit, General Motors Corp., produced its 100,000th 1947 model recently. Last year it was not until early December that 100,000 cars were made.

—o—

Bureau of Mines has released two publications describing wartime investigations of manganese deposits in Sierra and Socorro counties, New Mexico.

—o—

Ford Motor Co., Dearborn, Mich., plans to resume production of plate glass at its Rouge plant. With an output of 78 tons of glass a day expected, the first glass will pour through the rolls about Sept. 1. Shortage of soda ash forced suspension of the operation during most of the war.

—o—

Federated Metals Division, New York, American Smelting & Refining Co., has begun production of intermediate zinc at its new $200,000 plant in Los Angeles.

—o—

Great Lakes Carbon Corp., Chicgo, started production of rock wool in its new Youngstown plant recently. The facility, built at a cost of $250,000, has a capacity of 3500 bags of the insulating material daily.

The Business Trend

High Level Industrial Output Rate Regained

CONTINUING the upward swing from the lowest point recorded in more than a year, STEEL's industrial production index has climbed 10 points to a level not far short of the peak achieved during March when it stood at 164. Preliminary figures for the week ended July 19 place the index at 159, but indications point to a temporary leveling off near that figure due to shutdown of some automotive plants while sheet steel inventories are built up.

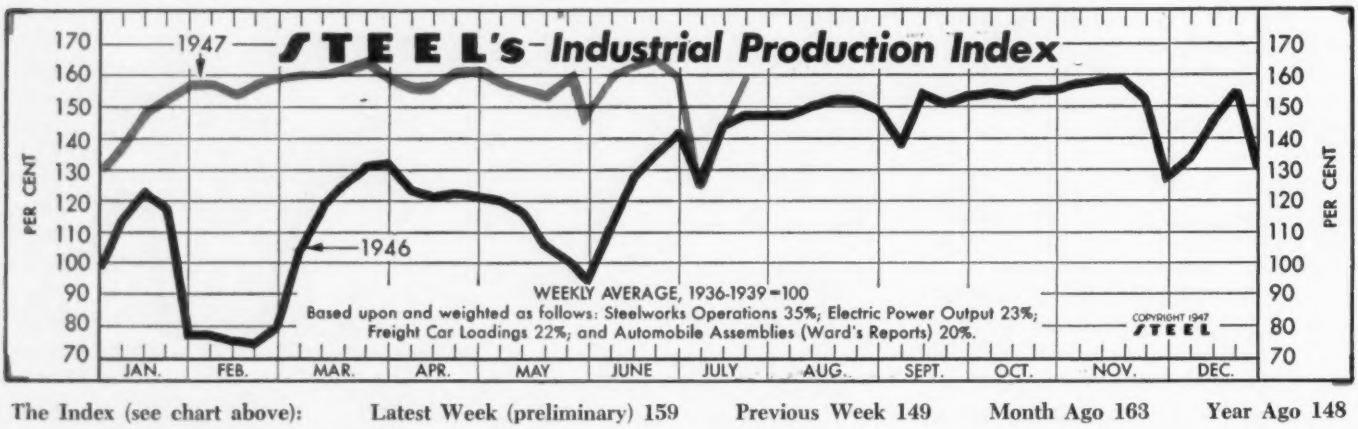
Despite the recent setback resulting from vacation closings and the coal miner's holiday, production this year is running at all-time high levels. According to President Truman in his special mid-year economic report to Congress last week the nation's estimated ouput of $225 billion this year far surpasses that of any previous year, the previous high having been attained in 1945 when production was valued at $213.1 billion. Production last year amounted to $203.7 billion.

STEEL—Climbing six and one half points, steel ingot production for the week ended July 19 stood at 92.5 per cent of capacity, and with the threat of a coal shortage removed district operations were scheduled to rise still further.

RAILROADS—Indicative of the high level of production sustained through the first six months of 1947, traffic on Class I railroads increased 16.1 per cent over the comparable period of 1946, the railroads handling 316,122,971,000 ton-miles. Increases over 1946 were noted in each month, although June's increase was less than in any other month this year—its 51.5 billion ton-miles being 3.5 per cent greater than in June, 1946. Railroad operating revenues in June increased 13.2 per cent over the same month of 1946. Estimated freight revenue was greater by 21.5 per cent, but estimated passenger revenue declined 21.5 per cent below that of a year ago.

PRICES—Higher prices for foods and a few nonagricultural goods in the week ended July 12 outweighed lower prices on a number of other commodities to push average primary market prices 0.2 per cent higher to 148.3 per cent of the 1926 average, the Bureau of Labor Statistics reports. Crude petroleum and petroleum products again advanced in price and substantial increases were noted in oven foundry coke prices. Bituminous and anthracite coal also were quoted at higher prices by a few producers.

CONSTRUCTION COSTS—Cost of industrial construction, which has tended upward since 1939, rising steeply in the postwar period, showed the first dip last quarter since it received a minor setback in December, 1943. In the quarter ended June 30, according to the Aberthaw Index, it dropped 3.5 points and now stands at 300 per cent of the 1915 base. Somewhat lower material and subcontract prices caused the drop; however, these were offset to some extent by increases in field labor rates which occurred during the quarter.



The Index (see chart above): Latest Week (preliminary) 159 Previous Week 149 Month Ago 163 Year Ago 148

FIGURES THIS WEEK

INDUSTRY	Latest Period*	Prior Week	Month Ago	Year Ago
Steel Ingot Output (per cent of capacity)†	92.5	86.0	96.5	88.0
Electric Power Distributed (million kilowatt hours)	4,732	4,531	4,676	4,293
Bituminous Coal Production (daily av.—1000 tons)	1,039	323	2,146	2,144
Petroleum Production (daily av.—1000 bbl.)	5,410	5,045	5,114	4,937
Construction Volume (ENR—Unit $1,000,000)	$104.4	$78.7	$94.5	$121.6
Automobile and Truck Output (Ward's—number units)	102,630	90,075	102,545	80,985

*Dates on request. †1947 weekly capacity is 1,749,928 net tons. 1946 weekly capacity was 1,762,381 net tons.

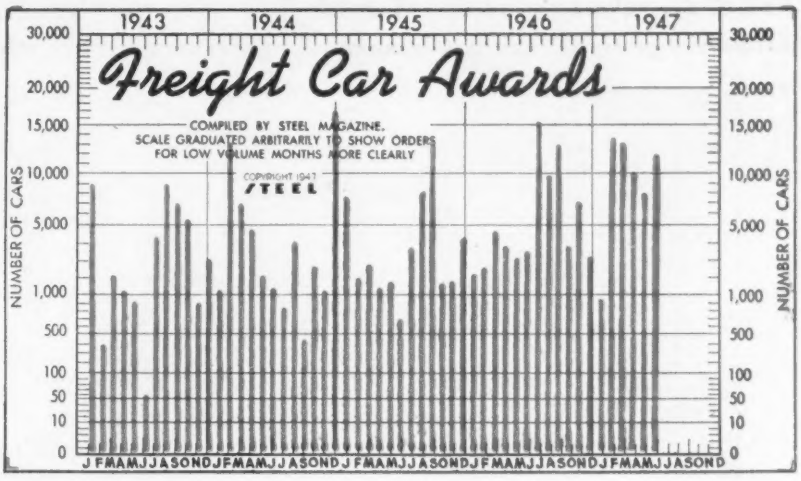
TRADE				
Freight Carloadings (unit—1000 cars)	890†	807	901	921
Business Failures (Dun & Bradstreet, number)	63	49	70	15
Money in Circulation (in millions of dollars)‡	$28,225	$28,363	$28,195	$28,241
Department Store Sales (change from like wk. a yr. ago)‡	+8%	+8%	+6%	+26%

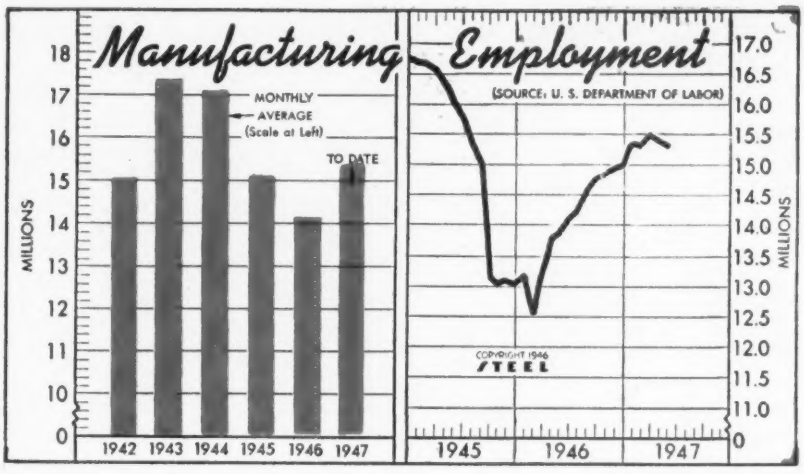
†Preliminary. ‡Federal Reserve Board.

Freight Car Awards

	*1947	*1946	1945	1944	1943
Jan.	9,172	1,500	7,200	1,020	8,365
Feb.	13,727	2,403	1,750	13,240	350
Mar.	12,049	4,512	2,500	6,510	1,935
Apr.	8,836	3,764	1,120	4,519	1,000
May	7,390	3,025	1,526	1,952	870
June	11,585	3,335	670	1,150	50
July	.....	14,836	3,500	795	4,190
Aug.	.....	9,629	7,240	3,900	8,747
Sept.	.....	12,768	12,840	400	6,820
Oct.	.....	3,407	1,320	2,425	5,258
Nov.	.....	6,707	1,650	1,065	870
Dec.	.....	3,041	4,116	16,245	2,919
Total	.....	68,927	45,432	53,221	41,374

* American Railway Car Institute.


Freight Car Awards
1943
1944
1945
1946
1947
COMPILED BY STEEL MAGAZINE.
SCALE GRADUATED ARBITRARILY TO SHOW ORDERS FOR LOW VOLUME MONTHS MORE CLEARLY
COPYRIGHT 1947 STEEL
NUMBER OF CARS
30,000
20,000
15,000
10,000
5,000
1,000
500
100
50
10
0
J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D



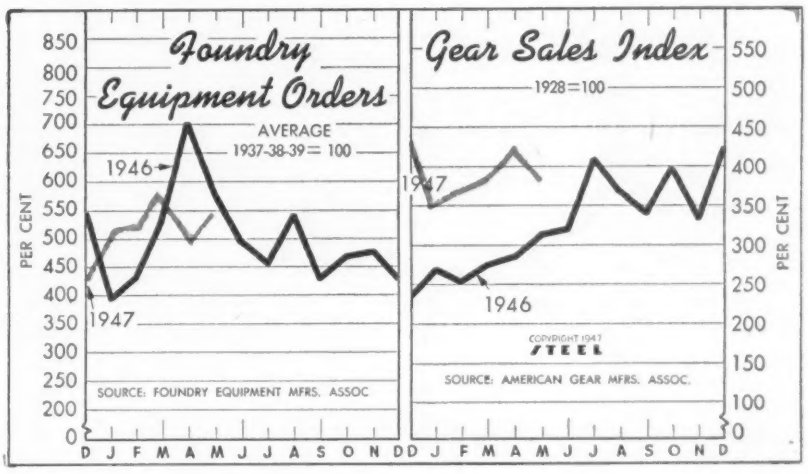
Factory Employment

(000 omitted)

	1947	1946	1945
January	15,372	13,499	16,696
February	15,483	12,751	16,684
March	15,511	13,433	16,557
April	15,418	14,045	16,302
May	15,260	14,159	16,012
June	.....	14,371	15,749
July	.....	14,526	15,331
August	.....	14,876	15,019
September	.....	15,035	13,159
October	.....	15,064	13,048
November	.....	15,271	13,110
December	.....	15,348	13,059
Monthly Ave.	.....	14,365	15,060

Foundry

	Equipment Orders —Index (1937-38-39=100)—			Gear Sales —Index (1928=100)—		
	1947	1946	1945	1947	1946	1945
Jan.	513.4	392.8	422.4	350	269	323
Feb.	521.9	432.8	465.3	376	253	331
Mar.	573.8	536.6	604.7	380	275	339
Apr.	512.1	701.2	325.0	424	284	296
May	548.6	577.3	404.7	387	313	309
June	...	491.7	375.4	...	321	271
July	....	453.4	411.7	...	407	264
Aug.	....	538.7	532.2	...	368	205
Sept.	....	424.4	577.2	...	342	213
Oct.	....	469.2	457.8	...	397	251
Nov.	....	477.4	416.6	...	336	255
Dec.	....	430.9	547.6	...	425	239
Ave.	...	493.9	461.7	...	332	275



FINANCE

	Latest Period*	Prior Week	Month Ago	Year Ago
Bank Clearings (Dun & Bradstreet—millions)	$12,548	$10,911	$13,135	$13,076
Federal Gross Debt (billions)	$258.5	$258.2	$257.4	$268.3
Bond Volume, NYSE (millions)	$26.7	$18.2	$18.4	$17.8
Stocks Sales, NYSE (thousands)	5,939	6,098	4,711	4,760
Loans and Investments (billions)†	$63.2	$63.4	$54.7	$60.6
United States Gov't. Obligations Held (millions)†	$39,099	$38,990	$34,171	$42,185

†Member banks, Federal Reserve System.

PRICES

STEEL's composite finished steel price average	$69.82	$69.82	$69.82	$64.45
All Commodities†	148.3	148.0	147.6	120.7
Industrial Raw Materials†	162.0	162.6	161.2	137.2
Manufactured Products†	143.7	142.8	142.9	115.3

†Bureau of Labor Statistics Index, 1926 = 100

Men of Industry

MAURICE R. EASTIN

WILFRED WILLIAMS

Maurice R. Eastin has been named sales manager of the Railway Division of the Minneapolis-Honeywell Regulator Co., Minneapolis. He succeeds **Karl W. Schick,** who has been named southwest regional manager, with headquarters in Dallas, Tex. Mr. Eastin had been a member of the sales staff of the Railway Division in New York. He will now have headquarters at Minneapolis.

—o—

T. J. Moore Jr. has been elected a vice president and director of Sharonsteel Products Co., Dearborn, Mich., a subsidiary of Sharon Steel Corp., Sharon, Pa.

—o—

William W. Boyne, district sales manager of Zenith Radio Corp., Chicago, has been appointed general manager of the subsidiary, Zenith Radio Distributing Corp.

—o—

Hickman Price Jr. has been appointed executive vice president of Kaiser-Frazer Export Corp., subsidiary of Kaiser-Frazer Corp., Willow Run, Mich. He has been associated with the company since its formation, and is a member of the board.

—o—

Robert L. Gray has been elected vice president of Self Winding Clock Co. Inc., Brooklyn, N. Y. He will be in charge of sales of advertising clocks.

—o—

Arthur A. Heuer has been appointed sales manager of the Furniture Division of the Barcalo Mfg. Co., Buffalo.

—o—

Sam Norris, sales manager for Amperex Electronic Corp., Brooklyn, N. Y., has been appointed executive vice president of the corporation.

—o—

Dr. Walter C. Rueckel, New York district sales manager for the Engineering & Construction Division of Koppers Co. Inc., Pittsburgh, has been appointed a vice president of the company. He will supervise relations with customers in South America.

—o—

Wilfred Williams, assistant sales manager, Acklin Stamping Co., Toledo, O., has been promoted to sales manager for the company. He will assume full responsibility for the eight district offices located in Buffalo, Cleveland, Cincinnati, Chicago, Indianapolis, Lansing, Milwaukee and New York.

—o—

Norman O. Kirkby has been named director of research of the Vapor Car Heating Co., Chicago. He had been connected with the sales service department of the company.

—o—

H. A. Green has been appointed general sales manager of the Royal Metal Mfg. Co., Chicago.

—o—

D. W. Frease has been elected president of the Empire Steel Corp., Mansfield, O., and **James Hill,** chairman of the board of the corporation.

—o—

J. H. Donahue, newly appointed general sales manager, Pioneer Steel Ball Inc., Unionville, Conn., has been elected secretary of the corporation.

—o—

Joseph F. Chalupa has been named manager of design engineering, Aviation Gas Turbine Division, Westinghouse Electric Corp., Philadelphia. He joined the corporation in 1930.

—o—

Hanley H. Smith has been appointed branch manager of the Pacific Steel Boiler Division, United States Radiator Corp., at Washington.

—o—

Ford Motor Co., Dearborn, Mich., has announced the appointment of resident controllers for three new Lincoln-Mercury assembly plants now under construction: **C. L. Martindale,** Los Angeles; **H. A. Yaeger,** St. Louis; and **Edward F. Walsh,** Metuchen, N. J. **Roy E. Rhoades** and **Earl W. Bolz** have been named assistant controllers in Los Angeles and St. Louis, respectively.

—o—

Thomas B. Moule, formerly assistant director of sales, Los Angeles office of the Plomb Tool Co., has been assigned the responsibility of supervising the company's expanded sales organization in the eastern half of the United States. His headquarters temporarily will be at the company's sales office, Chicago. **Jack G. Allen** has joined the Plomb sales staff to succeed Mr. Moule, and he will also supervise the export department. Before service in the U. S. Army during the war, he had been general manager of F. H. Noble & Co., Chicago.

—o—

Harold A. Harty, advertising manager, Wolverine Tube Division, Calumet & Hecla Consolidated Copper Co., Detroit, has been elected president of the Industrial Marketers of Detroit. He succeeds **Col. Forest U. Webster.** Other newly elected officers are: **W. F. Keeton,** vice president; **T. J. Orlando,** secretary; and **B. M. Tope,** treasurer. Directors elected to serve two years are **John Mason** and **E. E. Elder. D. A. Roehm** will serve as director for one year. As past president, Col. Webster will also serve on the board of directors.

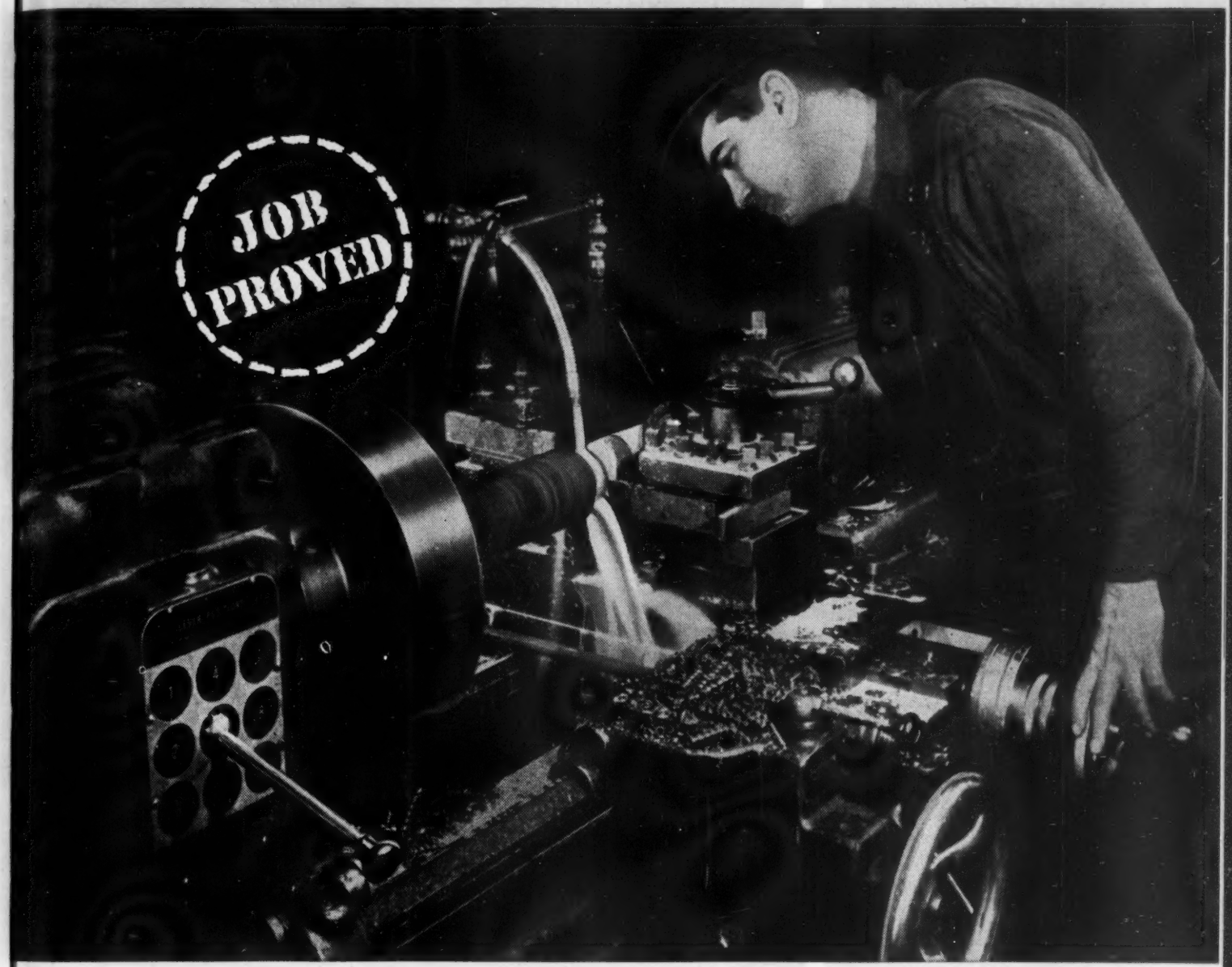
—o—

Thomas F. Ellis has been appointed assistant vice president, Shippers' Car Line Corp., New York. He formerly had been in charge of tank car traffic for the corporation and its subsidiaries, Kansas City Car Co. and Acme Tank Car Corp.

—o—

C. F. Mohrbacher has been appointed assistant sales manager of the Racine Division of the Twin Disc Clutch Co., Racine, Wis. Other appointments include: **A. E. Young,** appointed district manager of the West Coast territory, including California. He had previously been in charge of the company's sales activity of the Northwest territory, handled through the branch offices at Seattle. **E. H. Bennett,** appointed district manager of the Eastern territory, with headquarters at Newark, N. J. **W. L. Dixon** will continue his association with the Newark office in the capacity of consulting sales engineer. **J. B. Jenkins,** appointed district manager of the Michigan territory, with headquarters in the company's new sales office in Detroit. **P. G.**

3/8" Cut on S.A.E. 4640 Steel



SUNOCO EMULSIFYING CUTTING OIL

Permits Heavy Cut on 5" Heat-Treated Shaft

Here is a tough job, just one of thousands in which Sunoco makes possible fast, accurate machining:

Machine — 20" x 96" "American" Pacemaker multi-production lathe
Operation — Turning 5" diameter shaft
Material — S.A.E. 4640 steel, heat-treated
Spindle Speed — 133 r.p.m.
Cutting Speed — 175 s.f.p.m.
Depth of Cut — 3/8"
Feed — .015"
Tool — Cemented carbide
Cutting Lubricant — One part Sunoco to 20 parts water

For greater production, greater accuracy, smoother finish, put Sunoco, the "Job Proved" oil, to work in your shop. Sunoco quickly forms a stable emulsion when mixed with water. It has high lubricating and cooling qualities and is recommended for ferrous and nonferrous metals, alloy and carbon steels. For full information, or for a free copy of "Cutting and Grinding Facts," call the nearest Sun office today, or write Department S-7.

SUN
SUNOCO
INDUSTRIAL PRODUCTS

SUN OIL COMPANY · ***Philadelphia 3, Pa.***

Tyrrell, appointed assistant district manager in the territory served by the new Los Angeles office. **P. W. Wahler,** appointed assistant district manager in the territory served by the Seattle factory branch.

—o—

Leonard Larson, formerly connected with the Adel Precision Products Corp., Burbank, Calif., has been appointed sales manager of the Personal Airplanes Division of Texas Engineering & Mfg. Co. Inc., Dallas, Tex.

—o—

Fred C. Bond has been appointed technical director, and **Will Mitchell Jr.,** director, of the basic industries research laboratory, Allis-Chalmers Mfg. Co., Milwaukee. **Bruce H. Irwin** has been named assistant laboratory director and director of training for the department. Mr. Bond has been associated with Allis-Chalmers since 1930, and connected with a number of important projects, including erection and operation of the radium-uranium concentrator at Great Bear Lake, Canada.

—o—

Milton L. Seckel has been appointed district sales representative, Fort Duquesne Steel Co., Pittsburgh. His territory will include a portion of western New York state. He had been associated with Otis Steel Co., Cleveland, and more recently with Wheelock, Lovejoy & Co. Inc., and Brace-Mueller-Huntley Inc., Syracuse, N. Y.

—o—

The United States Pipe & Foundry Co., Burlington, N. J., has announced the following changes in its sales department personnel: In the San Francisco office, **Raymond Hausman,** formerly assistant Pacific Coast sales manager, has been promoted to Pacific Coast sales manager to succeed **Robert W. Martindale,** retired. **P. King Farrington** has been named assistant Pacific Coast sales manager. In the Chicago office, **Carl N. Brown,** formerly assistant western sales manager, has been promoted to western sales manager to succeed **William G. Savage,** retired. **J. Leslie Hart** has been named assistant western sales manager. In the Birmingham office, **Thomas W. McCreery,** formerly assistant southern sales manager, has been promoted to southern sales manager to succeed **Thomas Simons,** retired. **Robert C. Lemert** has been named assistant southern sales manager.

—o—

Elmer E. Sheldon has been appointed quality control engineer, Wire & Cable Division, General Electric Co., Schenectady, N. Y.

—o—

The Precision Steel Warehouse Inc., Chicago, has taken over representation of Cold Metal Products Co., Youngstown, and has appointed **Marshall C. Shields** special sales representative to handle Cold Metal's accounts. His territory will include Illinois, northern Indiana, Wisconsin, Minnesota and Iowa. **G. C. Tinsley Sr.,** president of Precision, had formerly handled representation of Cold Metal Products Co. as a separate activity.

—o—

Kasimir Janiszewski, president of Superior Steel Products Corp., Milwaukee, has been elected a member of the board of the Lincoln State Bank to succeed the late **Thomas Szewczykowski.**

—o—

Members elected to the board of directors of Bradner Mutual Enterprises Inc., Bradner, O., which held its first meeting July 8, were **Harold Sage, Rev. Wiegman, Brandon Smith, Ned Stiger** and **Russell Berridge.**

—o—

Offices have been opened by the Producers Steel Trading Corp. in Cincinnati for brokerage in iron and steel scrap. **A. Byer,** head of the American Compressed Steel Corp., is president of the new company. **Walter H. Maynard,** formerly with American Rolling Mill Co., Middletown, O., is secretary and general manager, and **H. D. Israel,** of the Israel Bros. Co., Dayton, O., is treasurer.

—o—

Frank B. Quinlan, section leader in the works laboratory of the General Electric Co., at Schenectady, N. Y., and developer of a pneumatic fatigue testing machine, has been awarded the Richard L. Templin award by the American Society of Testing Materials for his outstanding contributions to science in that field.

—o—

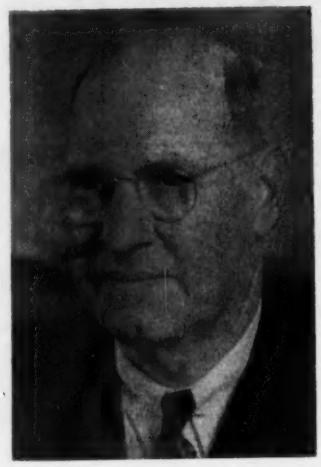
J. H. Stickle has been appointed advertising and sales promotion manager of the Home Radio Division, Westinghouse Electric Corp., Pittsburgh. He formerly had been associated with Philco Corp., Philadelphia.

—o—

Clyde M. Whittaker has been named president of the Universal Sanitary Mfg. Co., New Castle, Pa. He had been executive vice president for several years, and in his new position succeeds W. **Keith McAfee,** who became chairman of the board. **G. Ward Whittaker** has been appointed secretary and treasurer; **George E. Crawford** has been promoted from manager of manufacturing to vice president in charge of manufacturing; **Stanley S. Backner,** sales manager of the Camden, N. J., plant, has been named manager of the plant; **Ray G. Carruthers,** vice president, remains in charge of sales and product development.

—o—

Stanley W. Caywood, president of International B. F. Goodrich Co., Akron, has resigned. He recently completed 30



L. L. WILLFONG

Vice president and general manager, Earle M. Jorgensen Co., Forge Division, Los Angeles, celebrated his 50th anniversary in the steel industry. Noted in STEEL, July 21 issue, p. 94

years' service with the company. His activities have been entirely in the export field. After 9 years as assistant sales manager of the company's foreign department, Mr. Caywood became vice president and director of International B. F. Goodrich. In 1941 he was named general manager of the International Division, and vice president and director of eight associated subsidiary companies in various parts of the world. He was elected president in 1946.

—o—

J. Marcus Ward has been elected vice president in charge of sales, Heintz Mfg. Co., Philadelphia. Associated with the company for many years, Mr. Ward has been in charge of the Philadelphia sales office. He succeeds **William J. Bryan,** who retired last year.

—o—

Frank R. Armour Jr., general manager of the Manufacturing Division of H. J. Heinz Co., Pittsburgh, has been elected to the company's board of directors.

—o—

John W. Hager has been elected president of the Engineers Club of Birmingham. **Joe E. Hill** has been elected vice president; **C. P. Shook Jr.,** secretary-treasurer; **Mrs. Lucille M. Cunniff,** executive secretary; and **J. E. Getzen, Ralph Y. MacIntyre, F. B. Neilson** and **Sprigg C. Ebbert,** directors.

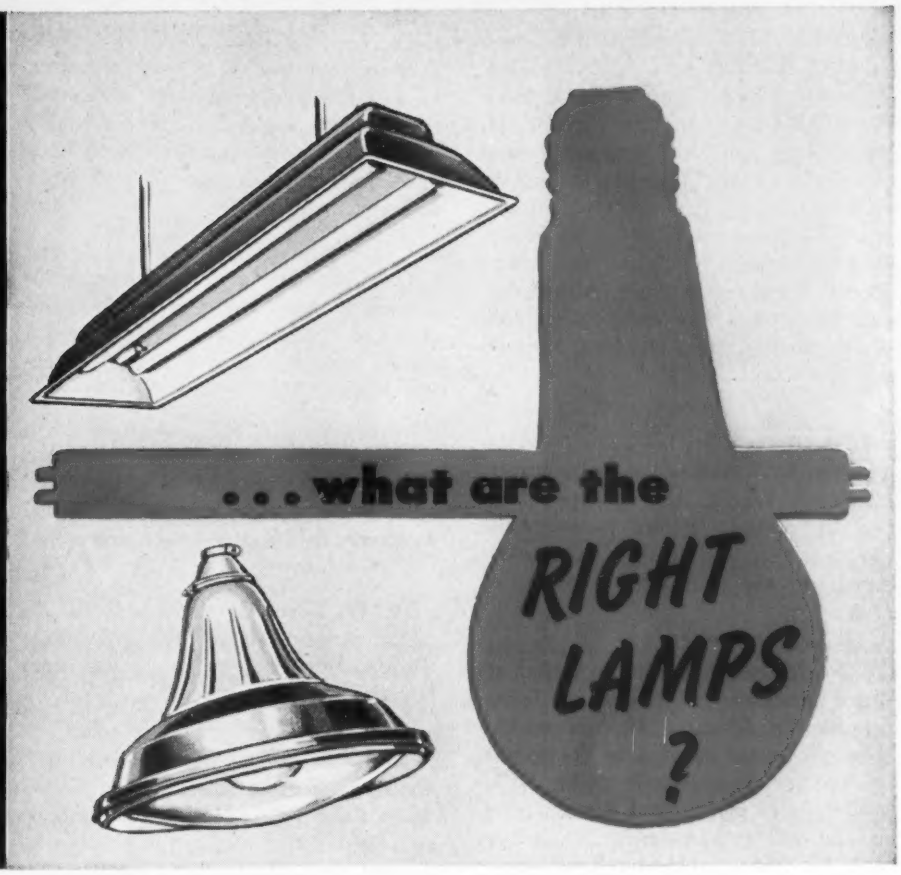
—o—

Courtney Johnson has been promoted to the post of assistant to the president of Studebaker Corp., South Bend, Ind. He will continue as assistant to the chairman of the board.

—o—

The Cold Metal Products Co., Youngstown, has announced the following appointments in its organization: **Howard W. Smith** has been appointed general manager of West Coast operations, with

For your fluorescent or incandescent lighting



Graybar's near-by office distributes them

Under normal conditions at Graybar warehouses, strategically located throughout the nation, stocks of G-E lamps are maintained for prompt, local delivery. Graybar distributes *all types* and *all sizes* of incandescent and fluorescent lamps for indoor, outdoor, and product lighting — plus germicidal, infra-red, and other special lamps. A Graybar Lamp Specialist will gladly help you determine the best type and wattage of lamp for any requirement.

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headquarters at the Western Warehouse Division, Los Angeles; **C. N. Wrobbel,** appointed sales manager of the Western Warehouse Division, and **Frank D. Locker** has joined the company's sales organization at that division. **William F. Skeer** has also joined the division, and will have headquarters at San Francisco. **Sam M. Marshall** has joined the eastern district sales organization, with headquarters in the company's New York office. He will cover the New England territory.

—o—

D. A. Griffith has been appointed assistant to **J. W. Mullen,** general manager, Pittsburgh Works, Allis-Chalmers Mfg. Co., Milwaukee. Before joining Allis-Chalmers, Mr. Griffith had been associated with the United States Bureau of Mines.

—o—

J. M. Johnson has been appointed assistant sales manager of Automatic Transportation Co., Chicago. He formerly had been in charge of sales for the Transporter Division, working directly under **R. L. Wolter,** sales manager of the company, and he will now assist Mr. Wolter in both the Transporter and Truck Divisions. His new post combines his previous position with that formerly filled by **J. A. Baldinger,** recently named assistant to the general manager, formerly assistant sales manager for the Truck Division.

—o—

Chester L. Jones Jr., Monsanto Chemical Co., St. Louis, has been promoted to sales manager of the protective coatings department, Merrimac Division, Boston. He formerly had been manager of the product development department of the Plastics Division, Springfield, Mass.

—o—

D. J. Smith has been elected president of Pan American Petroleum & Transport Co., New York, to succeed the late **E. G. McKeever.** Mr. Smith formerly had been first vice president of the company and president of several subsidiaries.

—o—

F. M. White retires Aug. 1 from Bethlehem Steel Co., Bethlehem, Pa. In recent years he headed the reinforcing steel and piling department in the Chicago district sales office. He had been district sales manager of Kalman Steel Co. from 1924 to 1936, in which latter year the company was absorbed by Bethlehem.

—o—

Walter S. Beck has been appointed assistant manager of the industry department of Westinghouse Electric International Co., subsidiary of Westinghouse Electric Corp., Pittsburgh.

—o—

C. H. Nock has been elected president, Nock Fire Brick Co., Cleveland. **G. J. Nock** has been elected vice president-secretary, and **R. L. Nock,** treasurer. **C. J. Nock** has resigned as vice president and has acquired the firm formerly known as Nock & Sons Co., which he is now operating under the name of Nock & Son Co.

—o—

C. M. Brooks has resigned as superintendent of Busch Sulzer Bros. Diesel Engine Co., St. Louis, and has accepted a similar position at Scovel Mfg. Co., Benton Harbor, Mich.

—o—

The Miller Motor Co., Chicago, has announced the opening of a Cleveland office in the Arcade Bldg., with **Michael A. Morris,** field engineer, in charge.

—o—

W. W. Edens, formerly technical director, Ampco Metal Inc., Milwaukee, has joined the Badger Brass & Aluminum Foundry Co., Milwaukee.

—o—

F. G. Sargeant, Minneapolis district manager for Fisk Tires Division, United States Rubber Co., New York, has been appointed district manager in Chicago, to succeed **W. L. Barbon,** who has resigned. **A. A. Begyhn** has been named to succeed Mr. Sargeant at Minneapolis. **C. J. Morgan** has been appointed special divisional manager. He is succeeded as New York district manager by **J. J. Davison. Harry M. Ramsey** has been appointed sales manager of the Fisk Division, succeeding **J. Chester Ray,** who has been appointed sales manager of the U. S. Tires Division of the U. S. Rubber Co. **Walter D. Baldwin,** formerly sales manager, U. S. Tires Division, has been named director of manufacturers' sales for the division.

—o—

Robert Price has been appointed manager of the development department of the Plastics Division, B. F. Goodrich Co., Akron, and will have charge of all technical work at the new plant at Marietta, O. Mr. Price has been associated with the company since 1938, and for the last two years has been manager of technical service and development in the Plastics Division at Akron.

—o—

Joseph Fistere, secretary and a director of Mallinckrodt Chemical Works, St. Louis, has been elected vice president. He will continue as secretary.

—o—

Frank B. Powers, assistant to vice president-operations, Baldwin Locomotive Works, Eddystone Division, Eddystone, Pa., has been given complete responsibility for all engineering activities of the Eddystone Division.

—o—

Robert E. Waldo, personnel director of the Buick-Oldsmobile-Pontiac Assembly Division of General Motors Corp., Detroit, has been appointed assistant to **F. L. Burke,** vice president in charge of the accessory group in General Motors.

—o—

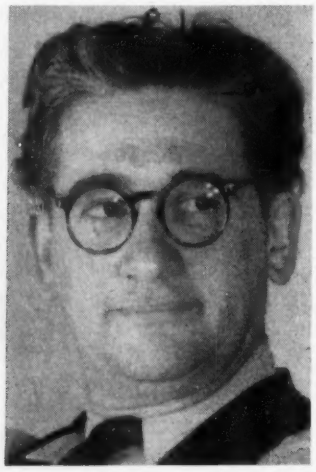
Dr. R. C. Gibson, director of research, Parker Rust Proof Co., Detroit, has been promoted to technical director in charge of all laboratory, development and pilot plant operations for the company. **Dr. Grant C. Bailey,** formerly with the research department of the Phillips Petroleum Co., Bartlesville, Okla., has been appointed manager of the research department of Parker Rust Proof, and **Gaillard W. Dell,** formerly with Bohn Aluminum & Brass Co., Detroit, has joined the research staff.

—o—

The Peninsular Steel Companies, Ohio, Michigan and Illinois corporations, have confirmed the following appointments: **George E. Kuhnle,** vice president and manager of the Ohio corporation,

EDWARD L. STOCKDALE

Has been elected president, Universal-Cyclops Steel Corp. Bridgeville, Pa. Noted in STEEL, July 21 issue, p. 90



DAVID F. SKLAR

Who has formed the Kent Cliff Laboratories at Peekskill, N. Y. Noted in STEEL, July 21 issue, p. 92

GEORGE B. LUERSSEN
Appointed to the post of chief metallurgist, Carpenter Steel Co., Reading, Pa. Noted in in STEEL, July 21 issue, p. 90

PAUL RHODES
Appointed purchasing agent for the Hyster Co., Portland, Oreg. Noted in STEEL, July 21 issue, p. 94

S. R. IVES
Elected president, Armco Drainage & Metal Products Inc., Middletown, O. Noted in STEEL, July 21 issue, p. 90

with headquarters at Cleveland; **William I. Trader,** vice president and assistant manager of the Michigan corporation, with headquarters at Detroit; **Norman B. McKeagan,** vice president and manager of the Illinois corporation, with headquarters at Chicago; **Henry W. Hartwick,** secretary and treasurer of the Ohio, Michigan and Illinois corporations, with headquarters at Detroit; and **Frank G. Davis,** general sales manager of all the corporations, with headquarters at Detroit.

—o—

Kirby Walker, formerly chief engineer, American Gas Machine Co., Albert Lea, Minn., has been appointed chief engineer of Consolidated Industries Inc., Lafayette, Ind.

—o—

Willis F. Harrington has retired as a member of the executive committee and vice president of E. I. du Pont de-Nemours & Co., Wilmington, Del., effective Aug. 1. **J. Warren Kinsman,** general manager of the company's fabrics and finishes department, and a member of the board, has been made a vice president, and was designated as a member of the executive committee. Mr. Harrington, associated with the company since 1904, will continue to serve as a member of the board.

—o—

N. K. G. Tholand has been elected first vice president and treasurer of the General Steel Warehouse Co. Inc., Chicago. **Y. A. Hogsten** has been elected second vice president and assistant treasurer, and **G. J. Zimmerman,** sales manager of the company.

—o—

Don E. Fricker has been appointed assistant advertising manager of the Heil Co., Milwaukee. Before entering the army, he had been in charge of advertising for the Le Roi Co., Milwaukee.

—o—

Theodore A. Harper has been named manager of sales, Grammer, Dempsey & Hudson Inc., Newark, N. J. He formerly had been in charge of cold-finished bar sales.

—o—

John L. Sweeney, manager of the Syracuse, N. Y., office of Otis Elevator Co., will retire Sept. 1. He joined the company in 1904, and has been Syracuse manager since 1920.

—o—

Donald A. Quarles, director of apparatus development, Bell Telephone Laboratories Inc., New York, has been elected a vice president of the company. He has been with the Bell system since 1919.

—o—

R. W. Kise has been named manager of sales, industrial heaters and devices section of General Electric Co., Schenectady, N. Y. He will be responsible for sales of Calrod heaters and heating devices for industrial use. He has been a sales and application engineer in the Industrial Heating Division.

OBITUARIES . . .

James L. Morgan, 57, vice president of the K. H. Davis Mfg. Corp., and sales engineer of the K. H. Davis Wire & Cable Corp., Los Angeles, died July 13.

—o—

Edmund H. Recker, 47, Chicago district manager for the S. K. Wellman Co., Cleveland, died July 19 in Chicago.

—o—

Harry Jump, 59, sales manager, Great Lakes Carbon Corp., Chicago, died July 15 in that city.

—o—

William C. Brown, 62, director of the blueprint department of the Sterling Engine Co., Buffalo, died July 12 in Buffalo.

—o—

Albert R. Curtis, 76, general purchasing agent for the National Enameling & Stamping Co., Milwaukee, died recently.

—o—

Roy E. Curtis, 67, former sales manager of the Osborn Mfg. Co. and the Bee Line Boiler Co., Cleveland, died July 18.

—o—

R. H. Gladfelter, 63, general sales manager, Detroit Power Screwdriver Co., Detroit, died recently.

—o—

Henry Mathis, 54, executive vice president and sales manager, New York Blower Co. of Chicago and LaPorte, Ind., died recently. He had been a past president of the National Association of Fan Manufacturers and the Industrial Unit Heater Association.

—o—

William E. Yunker, 67, works manager at Springfield, Ill., until his retirement in 1943, for Allis-Chalmers Mfg. Co., Milwaukee, died July 15.

—o—

Chester J. Boon, 58, sales manager for the American Steel & Wire Co., in Cincinnati, died at his home there July 13.

—o—

Wilson Fenn, 65, president of the Fenn Mfg. Co., Hartford, Conn. died July 18.

—o—

Harry N. Syster, 55, supervisor of mill sales, Latrobe Electric Steel Co., Latrobe, Pa., died July 21. He had been associated with the company for over 30 years.

—o—

Bert M. Kent, 67, president, Kent Electric Corp., Rome, N. Y., died in that city July 22. He formerly had been president of the Harris Products Co., Cleveland.

TEMPERING TOOL

TIME-TEMPERATURE relationships for structural transformations of alloy tool steels have been thoroughly reported but little information is available regarding the mechanical property changes which take place concomitant with these structural alterations. The effects of tempering temperature upon the hardness torsion and bend test properties are known for a limited number of tempering times or tempering cycles and for a limited number of types of tool steels.

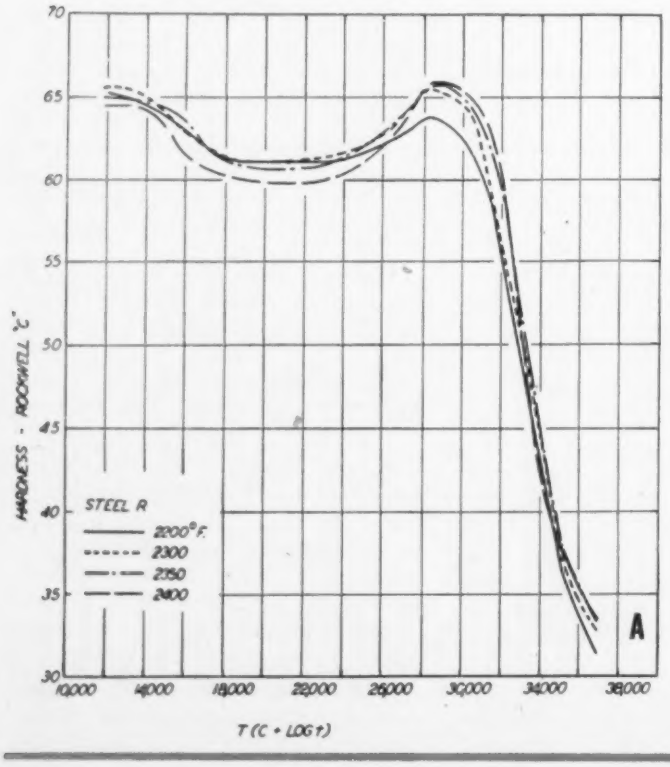
In order to evaluate more thoroughly the specific effects of structural changes on the properties, it was felt that a thorough study of the hardness changes on tempering would be of benefit. This study has been conducted on three important high speed steels in common use, on three highly alloyed die steels generally used for cold working applications and on two alloy die steels of importance on hot working applications. While all of these grades do not show marked secondary hardening, especially when hardened from low temperatures, they are all characterized by a high resistance to softening on tempering and by an ability to retain relatively large quantities of austenite (from 10 to 50 per cent) when hardened from high temperatures.

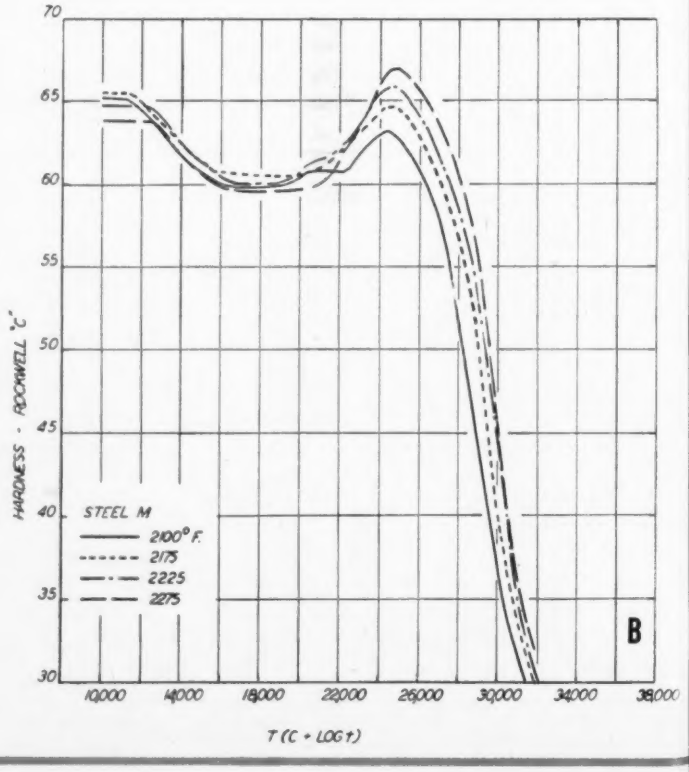
Compositions of the three high speed steels investigated are shown in Table I. These include a standard 18-4-1 tungsten high speed steel (steel R), a standard 6-5-2 tungsten-molybdenum high speed steel, now commonly known as the M-2 type (steel M) and a special high carbon-high vanadium, tungsten-molybdenum high speed steel containing approximately 1.25 per cent carbon and 4 per cent vanadium (steel N).

For each of the high speed steels the complete tempering-hardness relationship was investigated for four different hardening temperatures listed in Table II. For each hardening temperature 120 samples approximately ½-in. round by ⅝-in. long were employed. The samples from each hardening temperature were heated and quenched in oil simultaneously, with special care being taken to insure that all samples in each run were brought to temperature at the same rate, and that the temperature conditions were uniform across the screen upon which the sanples were placed.

After quenching, approximately 0.040-in. was ground from the surface to be tested for hardness and readings were taken on each quenched sample with all precautions being observed to insure results of extreme accuracy. The testing machine was standardized before starting and after each twenty samples. At least seven readings were taken on each sample and the last five were recorded. Table II shows the minimum, maximum and average value of the quenched hardness for each steel hardened from each quenching temperature.

The range of hardness variations was small; with but few exceptions the maximum spread in quenched hardness values of 90 samples in any lot selected for subsequent tempering tests was one point rockwell C, well within the accuracy of the hardness testing machine. Fig. 4 shows the distribution curves of quenched hardness for





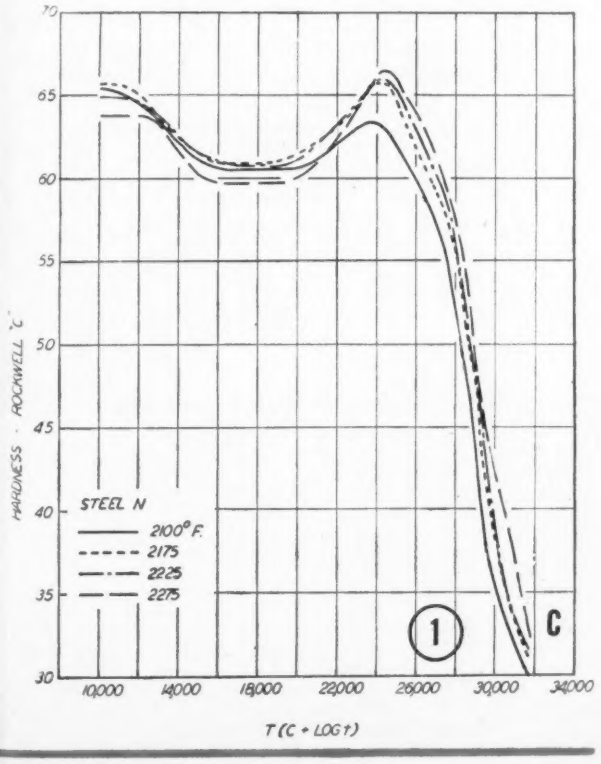
L STEELS

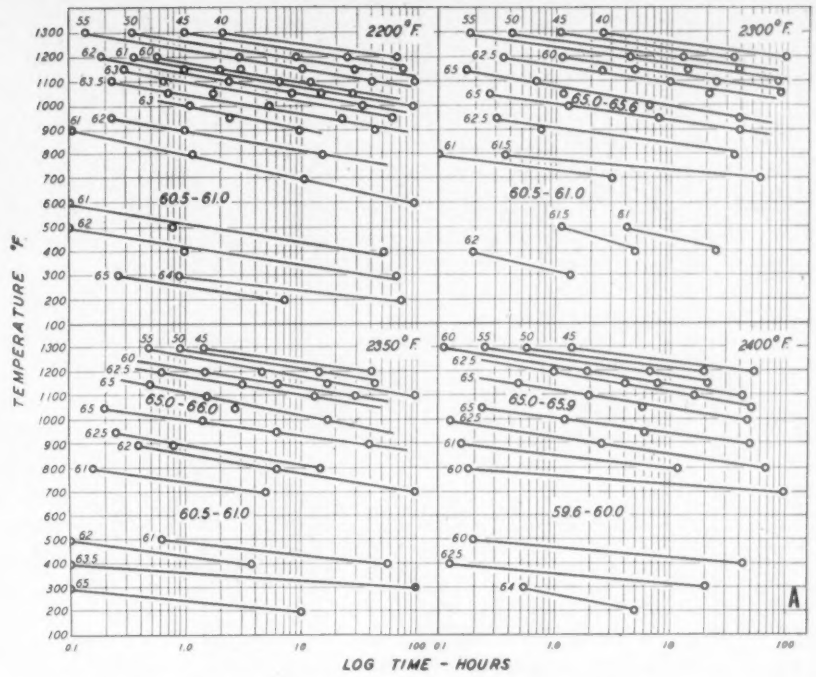
In this first section of a two-part series, the author presents complete data on the interrelation of hardness, tempering time and tempering temperature of three important high speed steels that are in common use

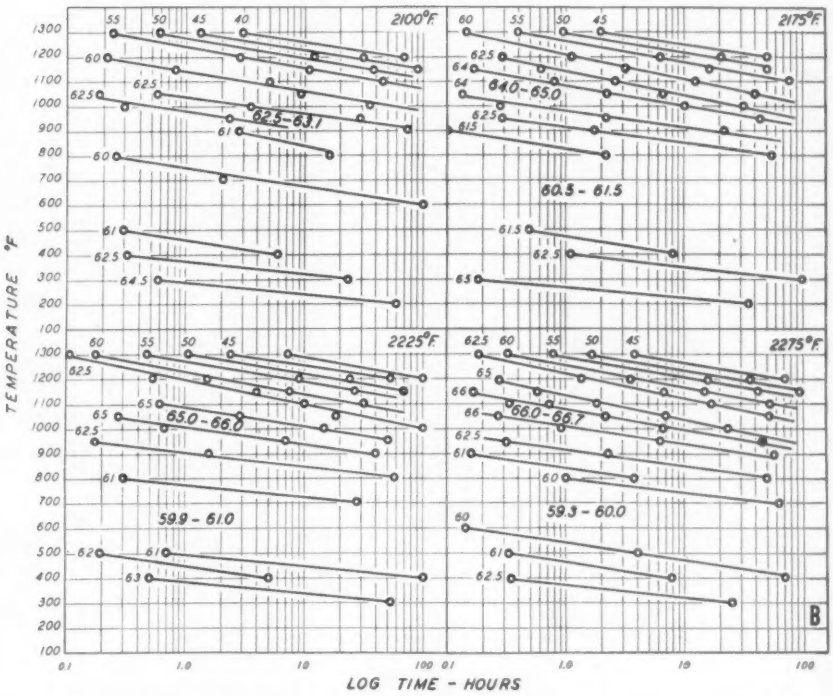
By GEORGE A. ROBERTS
Chief Metallurgist
Vanadium Alloys Steel Co.
Pittsburgh

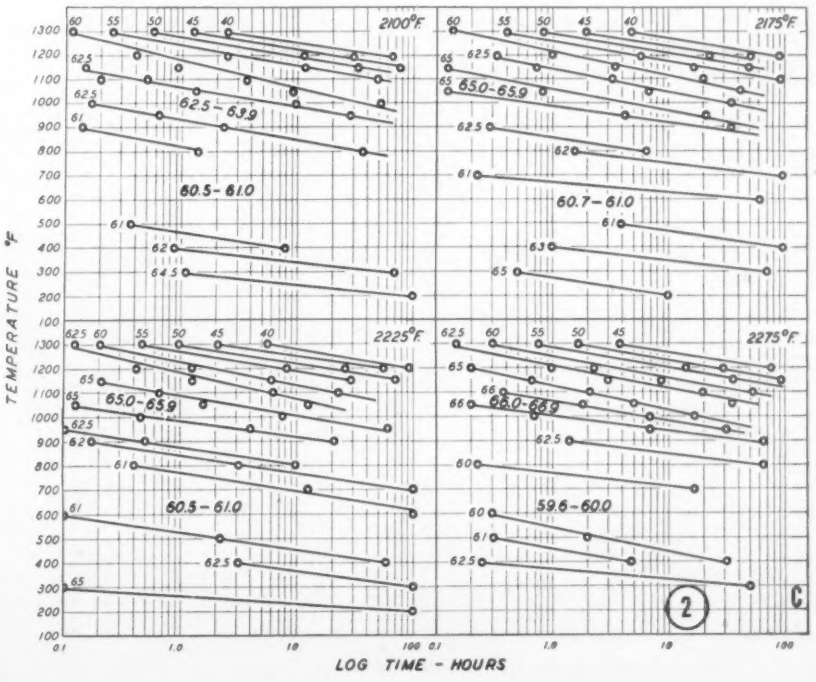
Fig. 1—Master tempering curves for three high speed steels (a) steel R, "c" 19.0 (b) steel M, "c" 16.3, (c) steel N, "c" 16.1

Fig. 2—(a) Iso-hardness chart for steel R, (b) for steel M, (c) for steel N









steel R when quenched from 2200, 2300, 2350 and 2400° F respectively. It will be noted that only when a temperature of 2400° F is reached does the hardness drop noticeably because of the increased quantity of retained austenite in this tungsten high speed steel. This is typical of all the high speed steels investigated. Microscopic examination was made on quenched samples from each lot and intercept grain size values that were obtained on these samples are shown below on this page in Table II.

It is known that steel R when hardened from 2350° F and the two molybdenum-tungsten steels, M and N, when hardened from 2225° F have 20 to 25 per cent and 25 to 30 per cent retained austenite respectively. At the higher hardening temperatures of 2400° F and 2275° F respectively, slightly greater amounts of retained austenite may be anticipated. It is obvious, therefore, that amounts of retained austenite of 30 per cent or over must be obtained before an appreciable drop in quenched hardness will be noted in high speed steels.

Tempering of the samples was done in salt or oil baths. Temperatures used ranged from 200 to 1300° F and times from 6 min to 100 hours. After tempering, all samples were again ground and hardness readings were taken as before.

Voluminous data obtained can be plotted in at least four ways. These are hardness versus tempering temperatures for various times, Fig. 3; hardness versus tempering time for various temperatures; tempering time-temperature relationships to produce equal hardnesses, Figs. 2a, b and c; and "master tempering curves" in which the data are plotted on a temperature versus tempering parameter chart as devised by Hollomon and Jaffe, Figs. 1a, b and c. Figs. 2a, b and c are iso-hardness curves for steels R, M and N, respectively, in which the co-ordinates are tempering temperature in degrees fahrenheit and the tempering time in hours plotted logarithmically.

Almost perfect straight line relationships are obtained when connecting points of equal hardness for any steel quenched from any of the four hardening temperatures. The use of these charts permits the selection of a multitude of different tempering cycles which will produce equal hardness. The hardness values are shown on the charts in rockwell C numbers. Zones of minimum hardness are marked in the region (*Please turn to Page* 98)

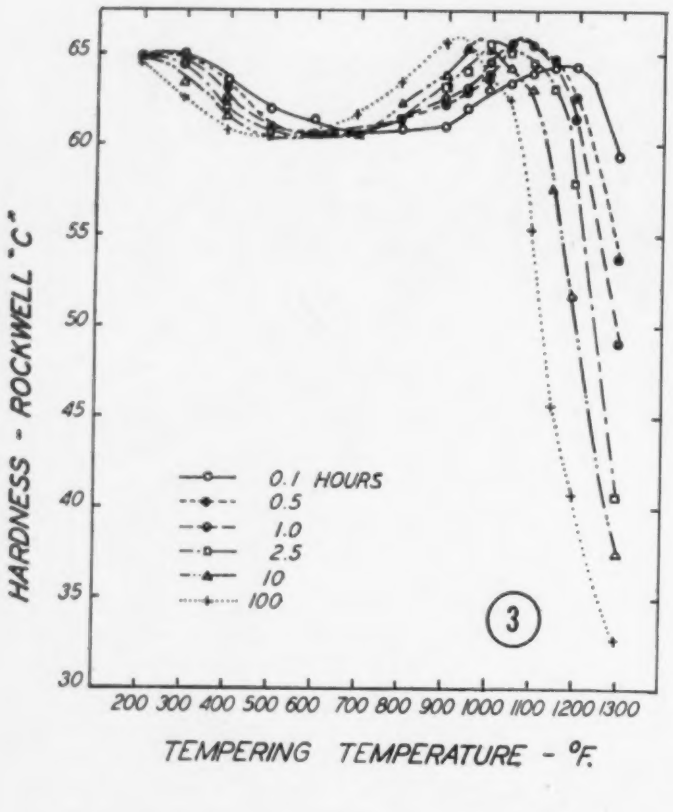


Fig. 3—Hardness-tempering temperature curves for steel R for six tempering times. Quenched from 2350° F

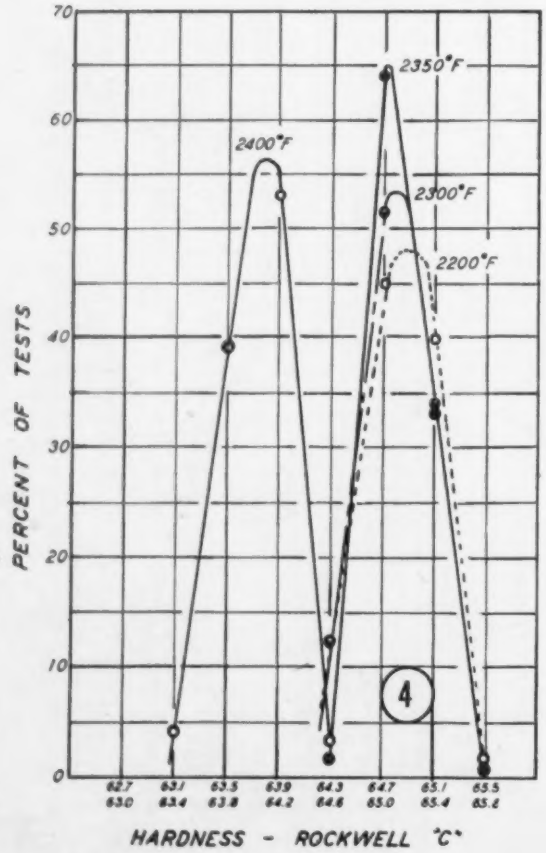


Fig. 4—Quenched hardness distribution curves for steel R for four quenching temperatures

TABLE I
ANALYSES OF HIGH SPEED STEELS

Steel Number	Type	C	Mn	Si	P	S	Cr	W	Mo	V
R	18-4-1	0.74	0.26	0.28	0.018	0.010	3.96	17.58	0.40	1.03
M	6-5-2	0.82	0.28	0.28	0.021	0.008	4.15	6.54	5.09	1.92
N Hi C	6-5-4	1.26	0.30	0.33	0.025	0.011	4.42	5.53	4.59	4.20

TABLE II
HARDENING PROCEDURE, QUENCHED HARDNESS AND GRAIN SIZE

Steel Number	Quenching Temp. °F.	Quenching Medium	Quenched Hardness Range Rockwell "C" Min.	Max.	Avg.	Intercept Grain Size	"c" Value
R	2200	Oil	64.5	65.4	64.9	13	19.1
	2300	Oil	64.5	65.3	64.9	12	19.5
	2350	Oil	64.6	65.4	65.0	10	20.4
	2400	Oil	63.4	64.3	63.9	8	17.0
M	2100	Oil	64.5	65.5	65.1	12	17.0
	2175	Oil	64.6	65.2	64.9	11	15.8
	2225	Oil	64.5	65.0	64.7	10	17.2
	2275	Oil	63.1	63.7	63.4	6	15.2
N	2100	Oil	64.7	65.4	65.1	12	16.5
	2175	Oil	65.2	65.6	65.4	12	16.0
	2225	Oil	64.6	65.4	64.9	12	16.5
	2275	Oil	63.6	64.3	64.1	10	15.4

Safe-Ending

LARGE DIAMETER LOCOMOTIVE FLUES

Welding operation combines flashing and upsetting to process some 60 flues per hour

RECENT installation of a flash welder and stripper for safe-ending locomotive boiler flues enables Union Pacific railroad to produce uniform welds which are stronger than the parent weld in its Cheyenne, Wyo., shops. Welder, made by Sciaky Bros. Inc., Chicago, features a low power demand, obtained by special design of the electrical circuit, resulting in a high power factor. This was improved to close to unity power factor by use of a series of capacitors.

Shown in operation in Fig. 1, the welder is arranged with two moving slides, automatically controlled in relation to each other. The right hand slide is for flashing and that on the left for upsetting, this arrangement permitting adjustments to obtain the most satisfactory conditions during flashing without making any compromise during the upsetting. Time of application of the upset and the magnitude of the force applied may be separately adjusted to obtain the best weld without disturbing the flashing adjustments.

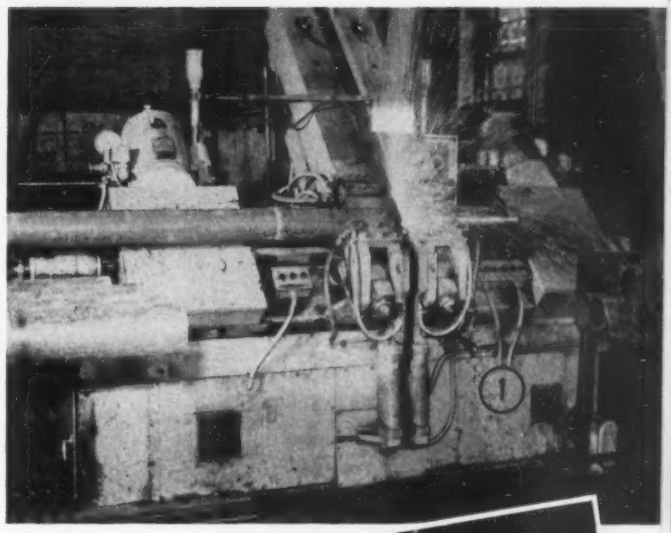
Inclusion of two separate transformers, one each for the lower and upper dies, and each with a tap switch for adjustment of heat which is uniform around the perimeter of the tube, provides the flexibility required for the best results on any size flue from 2 to 5½-in. According to performance reports from the user and the manufacturer, the machine can safe-end sixty 5 3/4-in. diameter flues per hour, or as many as 120 to 150 2-in. flues per hour.

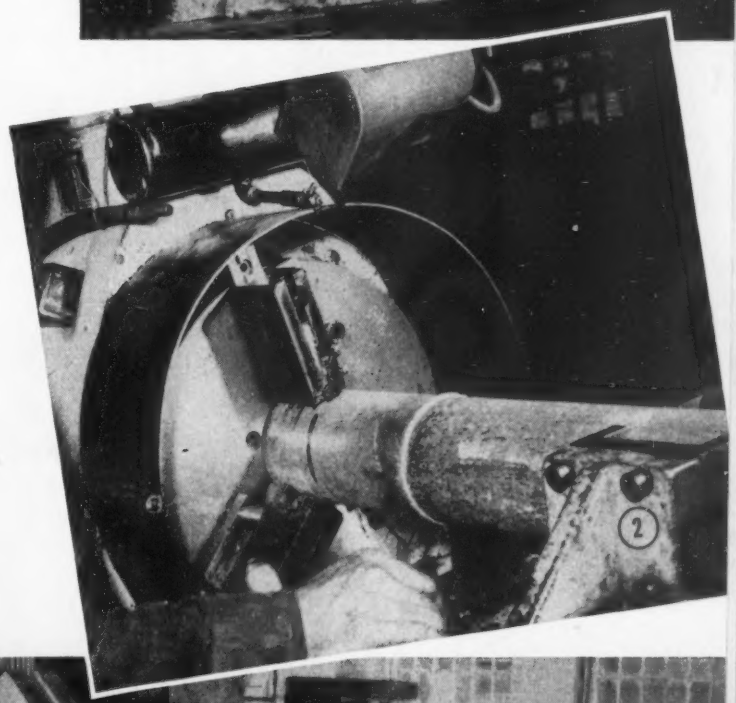
Platens and clamps of machine are tilted to a 45-degree angle to facilitiate loading and unloading. Less than 1 min is required to weld a 5½-in. flue.

Used in conjunction with the butt welder is a stripper for removing material upset in the welding operation. The machine, shown in Fig. 2 and at right in Fig. 1, consists of an internal and an external cutter head, rotating in opposite directions, and a power-operated carriage with provisions for gripping the flue and feeding it longitudinally.

Union Pacific found that four men can turn out 60 completed 5½-in. diameter flues per hour using this welder and stripper. One man operates the welding machine, the second the stripper and the remaining two are helpers who handle the material.

Originally, the railroad had intended to purchase five welding machines inasmuch as it welded boiler tubes in five shops. Upon installation of the first machine, it was discovered that this machine produced nearly three times as many completed tubes as had formerly been attained.





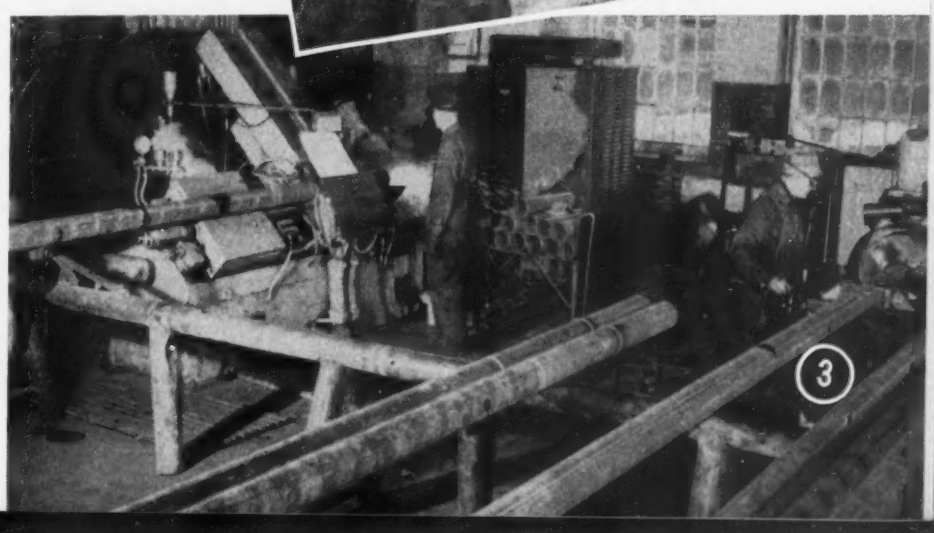


Fig. 1—Overall view of flash welder installed in Union Pacific Cheyenne, Wyo. shops. Operation is entirely automatic after machine is loaded and started

Fig. 2—Stripper used to remove upset material from boiler tubes after welding. Material not removed in photograph

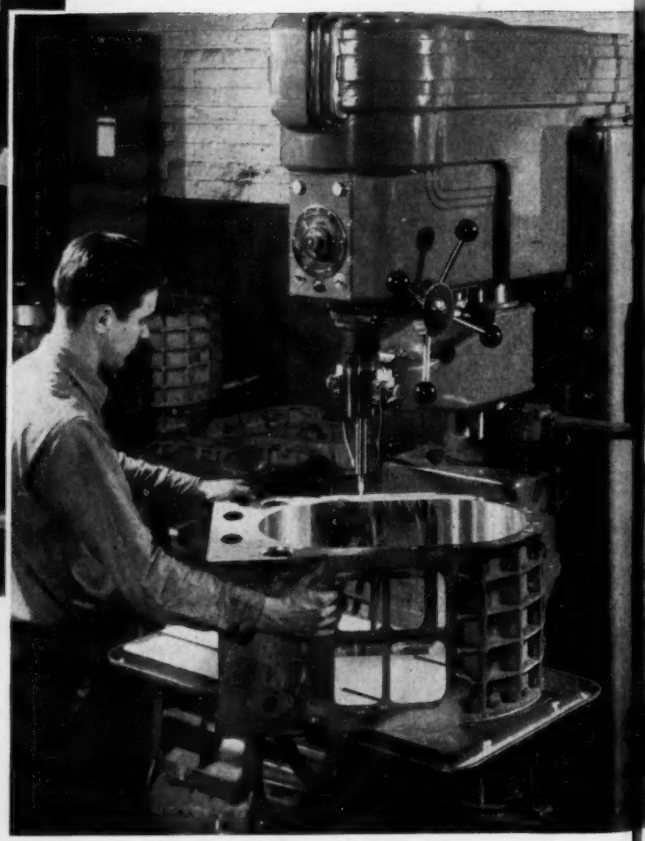
Fig. 3—View of shop layout showing welder at left and stripper at right. Welded tubes are rolled across to stripper upon completion. These two operators plus two handlers turn out sixty 5¾-in. diameter tubes per hour

THREADING...

Part Eight of a Series, and a Few Highlights on Development of Screws and Screw Making from the Inclined Plane and the Wedge-Bolt of Antiquity to the Techniques of Today Involving 25 Varieties of

MODERN MACHINE TOOLS

By GUY HUBBARD
Machine Tool Editor, STEEL



Tool engineers share honors with machine tool builders for making possible the practical working of multiple setups such as that shown above. One broken tool would tie up the whole job, hence strong, durable, fast cutting taps are a "must." General Motors photo

SCREW threads are inclined planes wrapped around cylinders or cones. The inclined plane is the simplest and probably the earliest recognized of all mechanical devices. Undoubtedly some prehistoric ancestor of ours caught onto the idea when he discovered that it was easier to drag or roll a heavy object up a slope than it was to boost it up the vertical face of a cliff. Primitive tools based on the principle of the wedge, are examples of mechanical applications of the inclined plane.

Nature may have suggested the original screw threads by vines wound around trees, or by certain helical sea shells or snail shells. Then again it may have been suggested by twisted fibers in cords or ropes. Be that as it may, the idea of the "wound up inclined plane" goes far back into antiquity, if we can take at face value the Old Testament illustrations of the Tower of Babel with its roadway spiraling into the clouds like the thread of a gigantic oil well tool. Incidentally, the Tower of Babel might be a good symbol for the state of confusion which existed in the field of screw threads until the situation was untangled through standardization about 70 years ago.

Although crude screws were made for use in presses in Roman times, the Romans used "wedge bolts" instead of bolts and nuts in mechanical construction. These were slotted bolts into which wedges or "drifts" were driven to lock parts together. Rudimentary screw cutting machines were built in France as early as 1569, but it was not until Henry Maudslay's time (about 1795) that the idea of moving a slide rest by means of a lead screw driven through change gears, was conceived.

That was one of the world's great inventions. Not only did it bring into being the screw cutting engine lathe, but it is an important principle in numerous other machine tools as well.

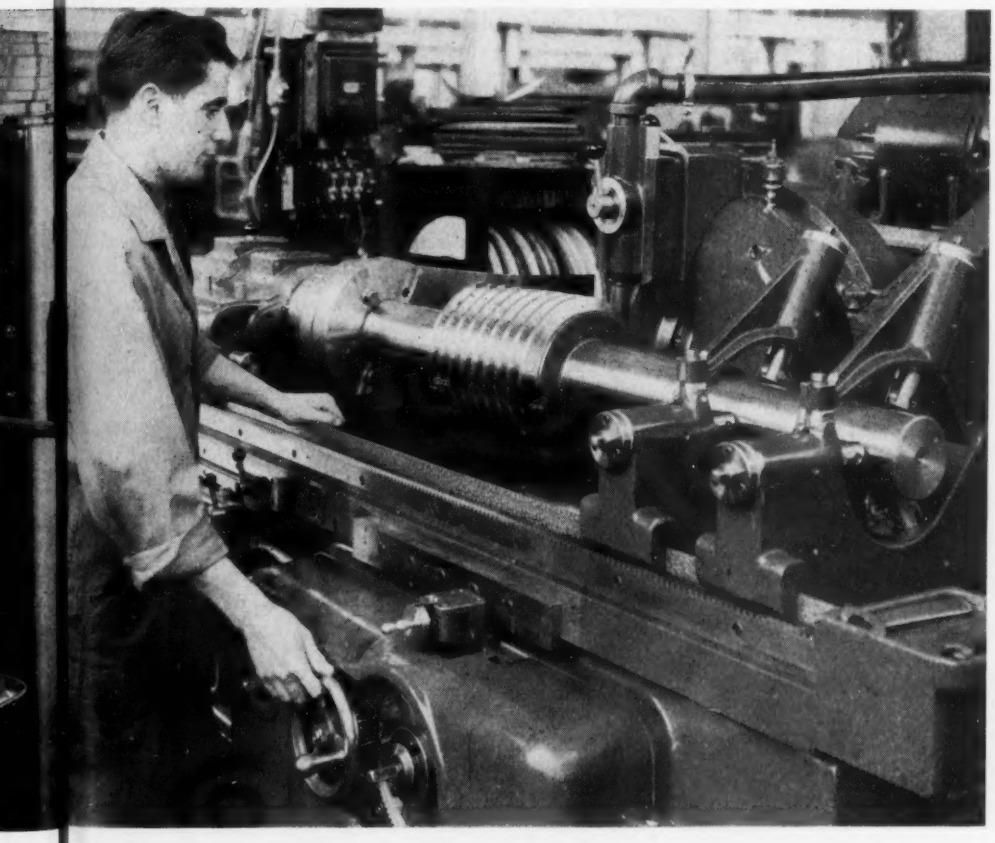
Just as "master flats" had to be created before planers could be built, so also "master screws" had to be made before mechanized screw cutting became an actuality. One method used was to wind an "inclined plane" made of paper, around a machined cylinder. The resulting spiral was prick-punched through to the metal, the prick punch marks then being connected by filing a line. This in turn served as a guide for laborious chipping and filing of a thread. A babbitt nut was then cast on this thread and in turn was used to guide a cutting tool which finished the thread.

Another expedient was to wind two wires around a cylinder, then remove one and "sweat on" the other with solder. Sometimes the resulting screw was used "as was," then again the soldered-on thread was used to guide a nut which in turn actuated a tool which cut a thread further along on the rod itself.

Henry Maudslay's finest original lead screws were cut by tools driven by crescent-shaped knives accurately set at pitch angle by a large, precision divided disk. When these crescents were forced into the surface of the blank they "incised" their way along the blank—moving a slide carrying a thread chasing tool.

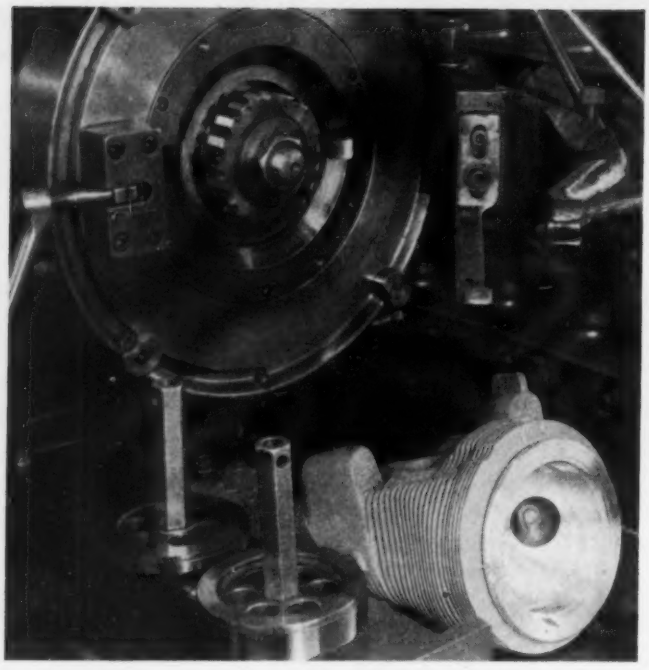
For the next 50 years or so the engine lathe was the primary threading machine. It still is a fine machine for precision threading both of interior and exterior work, and improvements in recent years have speeded up the process greatly.

Among those improvements are provisions for picking up the thread following rapid traverse to starting point, dials and stops giving accurate control of depth of cut, and—above all—the quick shift gear mechanisms which do away with pick-off gears and computations involved. Many of the younger mechanics today would be deeply puzzled by the mysteries of the old-fashioned engine lathe which had to be "set up" for screw cutting. Incidentally, many a shop coat got wound up in those old-time screw



Far left—Precision feeding of tap into work is accomplished on this Warner & Swasey precision tapping machine by means of a lead screw clamped between bronze fingers, in which mating threads are "hobbed" by the lead screw itself

Near left—Grinding an index worm for a helical gear generator in a Jones & Lamson automatic thread grinder using single-rib, diamond dressed wheel. Machines of this kind will handle small work such as a 1 in. diameter, 100 pitch thread gage, with equal facility



Hall planetary milling machine setup for cutting internal thread and machining shrink band of cylinder barrel. Photo courtesy Pratt & Whitney Division of United Aircraft Corp.

cutting gear trains. Thus they were physical—as well as mental—hazards.

I already have mentioned the Tower of Babel as being symbolic of the screw thread situation up to about 70 years ago. It doesn't seem possible that such a situation could have existed here in America for so many years after Eli Whitney and his followers got the interchangeable system of manufacturing into excellent shape in other respects. It was the westward advance of American railroads which finally brought the situation to a head.

As far back as 1864, it became painfully apparent to the Master Car Builders' that it was a serious matter when nuts made in Chicago would not fit bolts made in Boston, New York or Philadelphia. Even then it was another 20 years before the difficulties were ironed out. During the last years of his long and useful life, I used to visit with George Mead Bond at the Engineers' Club in New York. Mr. Bond had worked with William A. Rogers, professor of astronomy at Harvard College, on the successful efforts made by the Pratt & Whitney Co. to "standardize the inch" and thereby to lay the basis for accurate, standard screw threads.

As Mr. Bond sized up that notable standardization project of the early 1880s: "That man of science (Professor Rogers) turned his attention from the planets and the measurement of distances counted by millions of miles, to listen to the imprecations of a humble car-repairer lying on his back and cussing because a 5/8-in. nut which was 'a leetle small,' would not screw onto a bolt which was 'a trifle large.' This was an early and striking example of the assistance which science can give in conducting the practical affairs of life."

Only with the development of the automatic screw machine—invented by Christopher Miner Spencer in 1873—and the great improvements in taps and dies which took place at about the same time—did standard nuts, bolts and screws become reasonably good, reasonably cheap, and plentiful. The invention of the multiple spindle automatic by Henn and Hakewessel, and automatic opening die heads by Hartness, Landis and others between 1890 and 1900 gave further impetus to threading in automatics which was not seriously challenged until about the time of the first World War.

Since that time rolling and grinding methods have taken positions along side of cutting, as important threading techniques. High speed automatic tapping and threading machines also have come into wide use. Many of these machines have ingenious magazines. Also devices such as the "bent shank tap" driven by a bent tube through which the nuts travel over the shank in a continuous stream.

Incidentally, so-called "threading machines" of the variety originally developed to handle pipe, no longer are looked down upon by any machine tool builders who realize what has been going on recently. Those machines today are sturdy, accurate and extremely fast. Demands for extremely fine, accurate oil well supplies have had much to do with refinement of these machines. Precision methods of chaser manufacture—including ground thread forms—also have contributed. These machines no longer are hidden in dark corners of pipe shops. They are right out in the well-lighted production lines.

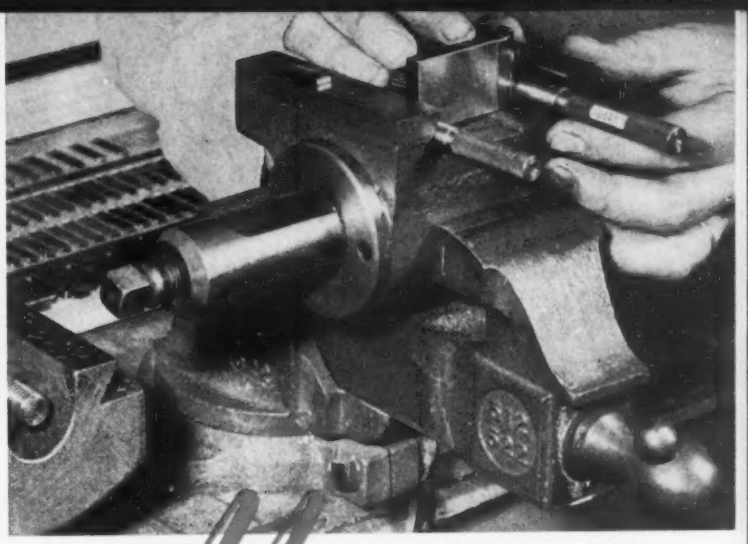
Grinding of thread forms likewise has had much to do with putting thread rolling into the catagory of precision threading. That applies both to serrated flat dies, which operate like rolling blanks between the palms of the hands, and circular dies, which roll with the blanks. Both systems conserve metal because they "mold" the thread instead of cutting it.

Thus, the "valleys" are pushed up into the "peaks" and the outside diameter of the finished thread is slightly greater than the original diameter of the blank. "Something for nothing," so to speak, and what could be any more important than that in these days of high costs and scarce materials? During the recent war, rolled threads received an important accolade when they won official acceptance on studs for aircraft engines.

Manufacturers of automatic opening die heads and collapsing taps have done remarkable work in improving those tools to keep pace with chaser developments. Some of the pioneers in these tools were skilled gunsmiths, whose experience in designing (*Please turn to Page* 102)

Some of those unknown factors in threading which now "lie over the hill" as far as most of us are concerned, will be brought into view at the Big Show, Dodge-Chicago plant, to be held Sept. 17-26, 1947

They may be in the form of new machines, they may be in the form of new tools, they may be entirely new techniques.



By H. J. CHAMBERLAND

Microinch Machine Setups

. . . provided by "working" gage blocks

ANY suggestion to entrust gage blocks to a machine operator would, but a few years back, have been bluntly rejected as a fantastic idea. Today, however, the introduction of microinches into actual production is paying substantial dividends.

Gage block manufacturing has now reached a possible high production level, through the gradual development of more and more efficient equipment and processing techniques. This efficiency does not eliminate the complications involved in making "AA" grade or "laboratory" quality blocks, because the blending of individual accuracy of flatness, surface finish, parallelism and dimension within plus or minus 0.000002-in. depends on some mechanical and scientific factors remaining unsolved.

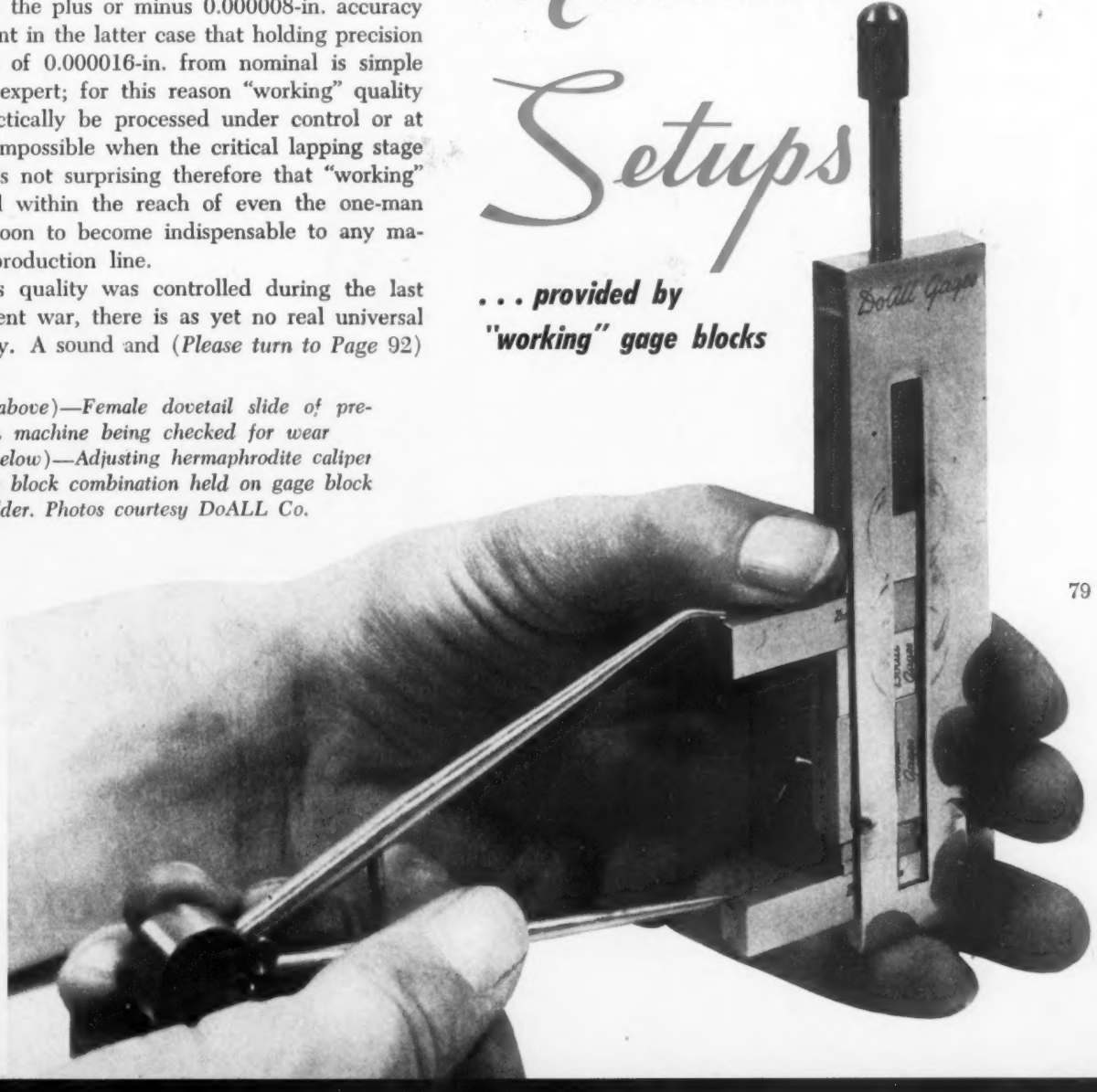
Inasmuch as a block showing an error of even 0.000003-in. with any of the four requisites of precision above mentioned cannot be accepted as of "AA" grade, it is obvious that a high percentage of a predetermined quantity of blocks being lapped simultaneously must be classified as "A" grade "laboratory" quality or "B" grade—"working" quality. This explains why "A" blocks having an accuracy of plus or minus 0.000004-in. are more available, costing about 25 per cent of "AA" blocks.

To hold blocks within an over-all accuracy of plus or minus 0.000004-in. on a quantity basis is not as yet a foolproof undertaking, so evidently some of the blocks will fail to meet these secondary requirements and must in turn be reclassified as "B" blocks providing of course they are within the plus or minus 0.000008-in. accuracy

It is significant in the latter case that holding precision within a range of 0.000016-in. from nominal is simple routine to the expert; for this reason "working" quality blocks can practically be processed under control or at will, which is impossible when the critical lapping stage is reached. It is not surprising therefore that "working" blocks are well within the reach of even the one-man shop and are soon to become indispensable to any machine on the production line.

Efficiently as quality was controlled during the last half of the recent war, there is as yet no real universal inspection policy. A sound and (*Please turn to Page* 92)

Fig. 1 (above)—Female dovetail slide of precision machine being checked for wear
Fig. 2 (below)—Adjusting hermaphrodite caliper with gage block combination held on gage block holder. Photos courtesy DoALL Co.



Supersonic Inspection for

Internal

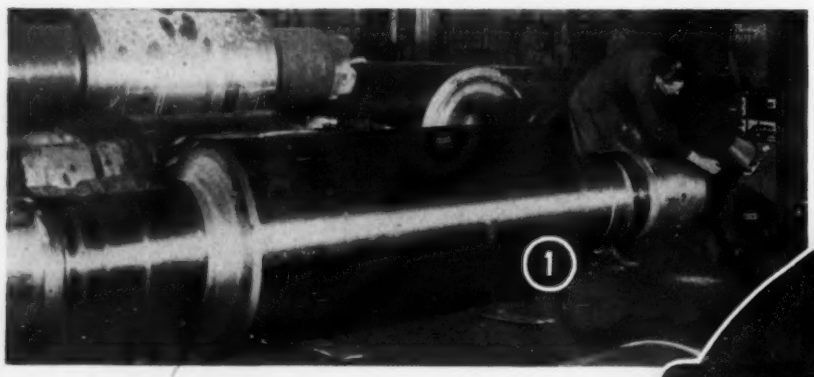
Exact location of fissures on interior of rolls up to 18 feet long and the transverse size and shape of the ruptures can be determined by the use of the reflectoscope instrument. Details of its construction and operation are described here

OCCURRENCE of internal fissures has been one of the most troublesome and persistent difficulties in the manufacture of cast-steel mill rolls. This defect has been denoted as an internal rupture, a hang, and an internal fissure, but these various names are all used in connection with the same type of failure. An internal fissure is, as its name implies, a fracture, or rather a discontinuity in section, located in the interior of a roll casting. A serious lack of agreement exists among metallurgists and foundrymen as to the nature and occurrence of this type of defect in roll castings. Up to the present time, no method devised to overcome this defect can be used with absolute results.

Ordinarily the exterior surface of a roll in the as-cast state gives no visual indication of the presence of an internal fissure; consequently, rolls containing such defects are processed through the usual heat treating and machining channels. Unless the defect is so large as to be revealed during machining operations, or unless the condition of mechanical stress which frequently accompanies this flaw is so great that the expansion and contraction occasioned by the heat treating process causes the surface of the roll to be fractured, the presence of the defect cannot be observed.

In many cases, an internal fissure is believed to be an actual void existing in the roll interior, which, although covering the major part of the transverse section of the roll at the point where it occurs, may have a longitudinal proportion that is extremely minute. When the transverse dimension of the fissure is so great that it extends into that part of the roll which is to be removed by machining, the presence of the defect may first be recognized as a hairline crack. If machining is continued at this point until the crack is revealed around the entire diameter of the roll, the roll casting may fall apart in the lathe, as the entire outer rim of metal which had been holding the roll together will have been removed. (See Figs. 6 to 8)

Occasionally rolls containing internal fissures are put into service in a rolling mill only to break when rolling pressures are first applied. This occurs when the fissure covers a large portion of the cross section of the roll. In other cases where the fissures are of lesser proportions, some service life may be obtained; and records show that a considerable portion of the expected service life has been obtained from rolls containing relatively large fis-



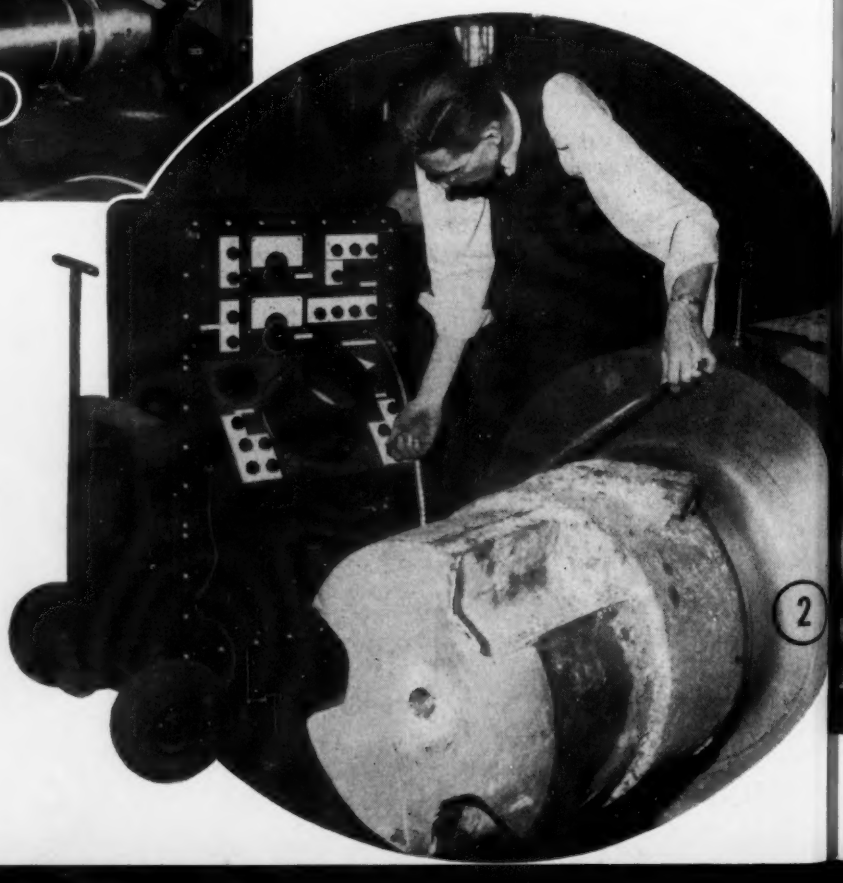


Fig. 1—Supersonic reflectoscope in operation. A long roll is being tested through its overall length

Fig. 2—Reflectoscope being used to check collar section of billet mill roll

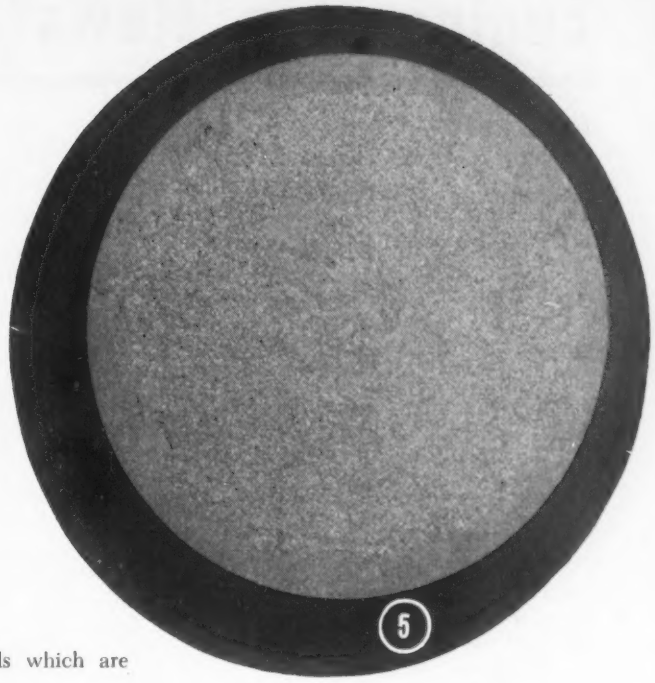
Fig. 3—Backup roll mounted in grinder for finishing operation

Fig. 4—Rolls of irregular section are checked easily for internal soundness by the reflectoscope

Fig. 5—Fracture in central portion of roll neck section is a transgranular fracture

By JOHN DUGAN
Superintendent, Roll Department
Ohio Steel Foundry Co.
Lima, O.

Fissures IN CAST ROLLS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sures. However, the accumulation of rolling stresses ordinarily will cause the roll to fail early in mill use. It is possible that small ruptures exist in many rolls that give good mill service and because they are so small, in comparison with the amount of good metal which surrounds them, they cause no ill effects and consequently are never detected.

Internal fissures may form in rolls of any size or analysis, although they usually occur in large diameter rolls with long body dimensions as shown in Fig. 8.

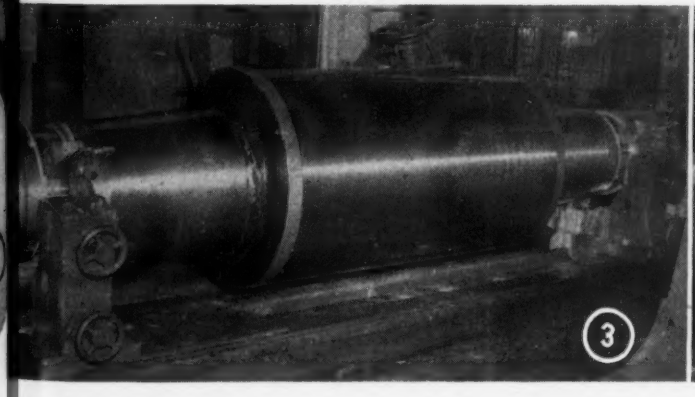
While the prevention of this type of defect continues to be a subject for considerable study in all rollmaking plants, its occasional occurrence has come to be looked upon almost as one of the costs incidental to this type of business, and along with the study of the causes of this failure much thought has been given to the development of a positive method for the detection of such a defect after it has occurred. Since the greater number of defects of this type occur in rolls of large size, although this condition is not confined to any particular type or size of roll, the loss of such a roll in terms of money is rather great even when the failure occurs in the maker's plant. However, if a roll containing such a defect gets into mill service only to break early in its mill life, the loss of prestige on the part of the maker is almost inestimable. All makers find it extremely necessary to assure themselves that internal fissures do not exist in rolls which are shipped from their plants.

Fig. 5 shows a transgranular fracture which occurred somewhere near the time of completion of the solidification process. The fracture indicates two types of crystalline structure: (1) The outer rim being a type of intergranular fracture which might be expected in properly heat treated steel for this analysis; and (2) the central section of an entirely different appearing crystalline makeup.

In former years the only method for testing to determine the soundness of a roll was a "striking" or "ring" test wherein the roll was struck with a heavy object and the rollmaker decided the condition of the roll by the sound thereby created. If the roll upon being struck gave a deep and continuing ringing sound, the roll was approved for shipment. A satisfactory roll upon being struck vibrates as one piece with the frequency determined primarily by the length of the roll. If the roll has an internal rupture, each section of the roll, as divided by the rupture vibrates with a frequency according to its respective length, in addition to the vibration of the sound metal at the roll surface which has a frequency determined by the overall length of the roll. The result is interference and a consequent dull weak sound which is the indication of a defective roll. Ring testing, however, is not infallible because it is based upon the interpretation of the sounds which are created and this interpretation is always susceptible to error. Unfortunately, many circumstances such as method of mounting roll for striking test, method of striking, surface condition, etc. can affect the audible sound.

Early in 1945 one of the early supersonic reflectoscope sets was placed in the roll shop of the Ohio Steel Foundry Co. Up to that time no tests had been conducted on specimens as large as even the smaller sizes of rolls. After many months of study, experimentation and practice it was found that the reflectoscope could be used to detect the presence of any internal fissure in a roll casting. After considerable experience in testing rolls, it is possible for an operator to determine the exact location of any internal fissure which may exist in a roll and, further, by checking at a sufficient number of other points, he may be able to tell the approximate transverse size and shape of the fissure. The range

(*Please turn to Page* 95)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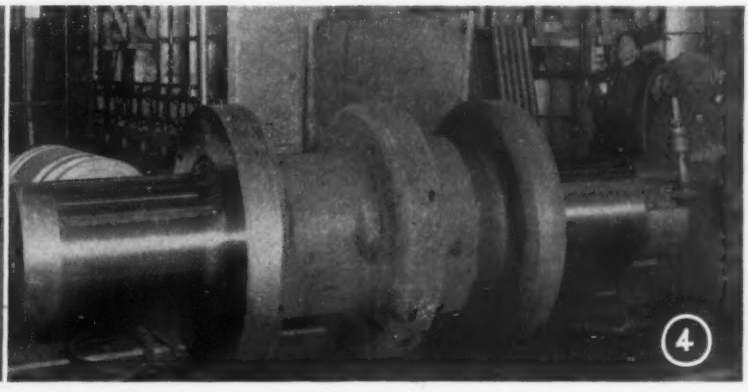
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Engineering News *at a Glance*

ROYALTY-FREE PATENTS: Patents currently available for licensing from the Department of Interior, Washington, on a nonexclusive, royalty-free basis include one on the treatment of ores, patent No. 2,288,610, one for producing low-sulphur sponge iron, No. 2,380,406 and one on a method of concentrating iron ore under patent No. 2,403,481. According to the bureau, applications for licenses on the above patents are to be made to the solicitor of the department. Copies of the patents may be obtained from the Patent Office.

HUGE BUT BURSTABLE: So large are the nitrogen-cooled motors currently being built for a large oil refinery, the Westinghouse *Engineer* reports, that the same reliance cannot be placed on the ability of the motor walls to resist bursting should an explosion occur inside, as on the smaller motors where ratio of outer surface to motor volume is much greater. Thus explosive gases must be positively excluded. The motors—2250 hp at 1800 rpm—large explosion-proof squirrel-cage motor units to date, will be connected to a supply of nitrogen or other inert gas and an internal pressure maintained slightly above atmospheric. A separate motor-driven oil pump will be required to maintain the seal around the shafts when one of these huge motors is shut down.

RE-INTRODUCES FACTORY SASH: In Jamestown, N. Y., Hope's Windows Inc., is again producing the Lok'd bar steel factory sash which it introduced in 1941. The development, which was forced off the market by the war effort, is especially designed for industrial buildings having large glazed wall areas, and those that require unusual weather tightness.

"SILVERED" ON FRONT SIDE: An aluminum-coated mirror, one on which metal is applied on the front surface of the glass, may be instrumental in improving the performance of many types of optical instruments such as telescopes, periscopes, gun sights, operating room reflectors and sugical instruments. Developed by Libbey-Owens-Ford Glass Co., the mirror provides the advantage of reflecting only a single image instead of a faintly discernible added image as in the case of one surfaced on the back. In the manufacturing process at the company's Liberty Mirror division at Brackenridge, Pa., referred to as thermal evaporation, a coating of hard quartz is deposited on the aluminum to insure durability of the metal film. This is tested to withstand extreme temperatures ranging from minus 60° F to well in excess of 200°, as well as for resistance to moisture and salt atmosphere.

LAB'S NAME CHANGED: To describe the broadened scope of scientific research on the many forms of propulsion systems now existent and contemplated for all flight machines from aircraft to supersonic missiles, National Advisory Committee for Aeronautics, Washington, recently changed the name of the Cleveland research center to NACA Flight Propulsion Research Laboratory. Formerly, it was known as the Aircraft Engine Research Laboratory.

DEVELOPS LIGHT ENGINE: Continental Motors Corp., Muskegon, Mich., is now producing a new 1½-hp single-cylinder, air-cooled engine for the mass market, represented by walking tractors, power lawnmowers, scooters, pumps, small construction equipment, compressors and other general utility equipment. The new engine, a 4-cycle, L-head unit cooled by a blower-type flywheel shrouded to force air over large cooling fins on the cylinder and head, is rated at 1½-shaft hp at 2400 rpm. Its stroke is 2 in., and piston displacement is 7 1/10-cu in.

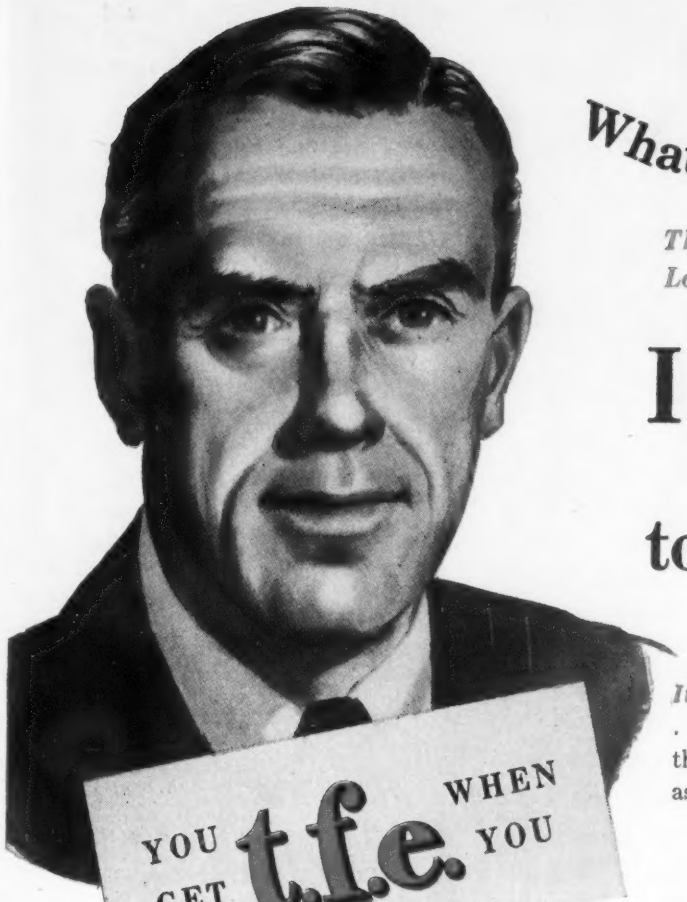
MEETS DRAFTING NEEDS: In Wichita, Kans., Lewis A. Paul of Beechcraft Aircraft Corp.'s engineering department, recently developed a new self-inking, capillary action "fountain" pen, termed the dream of the ruling and lettering pen user for more than a century. It is a drawing instrument that meets satisfactorily stringent requirements of the close tolerance work performed by engineering draftsmen. The development, on which patents have been applied, also can be used by artists, mechanical drawing students, photo touch-up experts or anyone whose work requires lines of regular density, width and blackness. With some adjustments, it also can be used for applying oils to delicate mechanisms, such as watches.

SUPER SERVICE: Manufacturing know-how, plus the co-operation of truckers and an airline recently enabled Shenango-Penn Mold Co., Dover, O., to provide Todd Shipyards Corp., Brooklyn, super service by completely producing in 3 days, from centrifugal casting to machined part, a huge 3-ton bronze propeller shaft sleeve urgently needed for installation in a C-3 cargo vessel. Time was so vital that the necessary foundry mold was completed on the same afternoon the order was received by phone. The big job was ready for casting by the next afternoon, then went into the company's lathes on the morning of the following day, after cooling. It was then hydrostatically pressure tested and inspected. On the morning of the fourth day the 18-ft, 6000-lb casting arrived at the Cleveland airport by truck, and from there it was shipped to New York by air, arriving in Brooklyn late the same afternoon.

SAME SIZE MORE PROTECTION: Portable electrical cords, developed by United States Rubber Co., New York, for use on tools and many other electric appliances, provides more protection yet presents no increase in overall diameter. Thickness of the new wire jacket, of heavy-duty neoprene rubber, is increased 30 to 60 per cent. This is attributed to application of laytex insulation on individual conductors within the cord. The laytex is applied by a dipping process which produces a thinner insulation with superior physical and electrical properties.

RECORD SLAB OUTPUT: Forty-five-inch reversing slabbing mill which recently shattered previous records by producing 159,792 tons of steel slabs in 1 month in the Homestead plant of U. S. Steel's Carnegie-Illinois Steel Corp., is one of the largest mills of its kind in the world. Designed and built by United Engineering & Foundry Co., Pittsburgh, to help meet urgent steel requirements during the war, it has rolled, since it began operating in January, 1944, more than 4¼-million tons. It produces slabs up to 20 in. thick in widths to 62 in. from huge ingots weighing as much as 60,000 lb. The mill's record output of 159,792 tons is reported to provide enough sheet steel for 175,000 autos. The mill also is one of the first of its type to use roller bearings.

NO STALLING ON CLUTCHES: Special machine for grinding and chamfering teeth on spring clutches, developed recently by Cross Co., Detroit, enables one operator to produce some 200 eight-tooth clutches per hour. A 3-station turret indexes the work from station to station. In addition to the indexing of the turret, parts automatically index on their own axis at each station from one tooth to the next. Another feature of the machine is the grinding wheels are dressed automatically while the turret indexes, size being maintained by automatically compensating for amount dressed from the wheel.



What do Fasteners Really Cost?

There's more to fastener cost than just price. Lots more. Personally . . .

I look for all 8 to get t.f.e.

True Fastener Economy

It is the many costs of using a fastener that count . . . not just the initial price. *True Fastener Economy* is the lowest *total* cost for fastener selection, purchase, assembly and performance.

YOU GET t.f.e. WHEN YOU

1. Reduce assembly time to a minimum by savings through use of accurate and uniform fasteners

2. Make your men happier by giving them fasteners that make their work easier

3. Reduce need for thorough plant inspection, due to confidence in supplier's quality control

4. Reduce the number and size of fasteners by proper design

5. Purchase maximum holding power per dollar of initial cost, by specifying correct type and size of fasteners

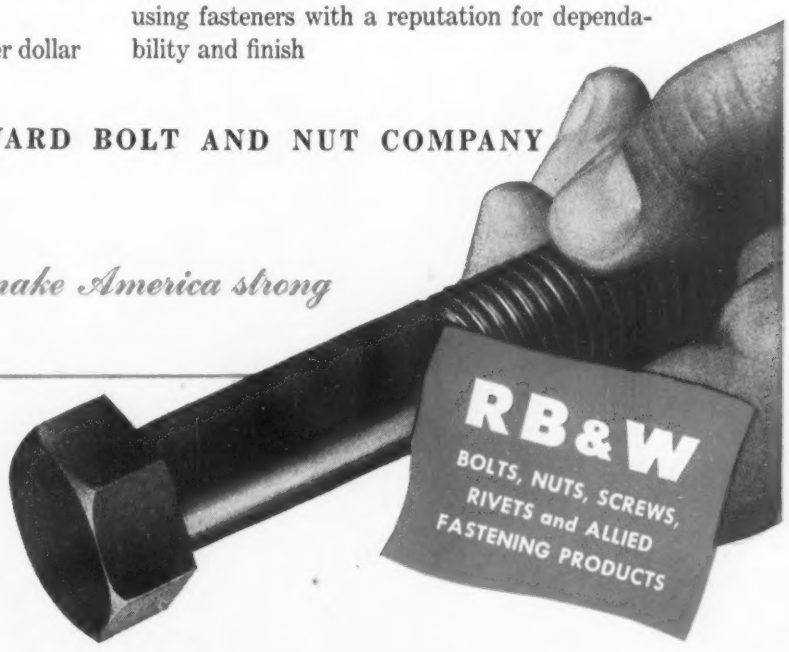
6. Simplify inventories by standardizing on fewer types and sizes of fasteners

7. Save purchasing time by buying larger quantities from one supplier's complete line

8. Contribute to sales value of final product by using fasteners with a reputation for dependability and finish

RUSSELL, BURDSALL & WARD BOLT AND NUT COMPANY

102 years making strong the things that make America strong



Plants at Port Chester, N. Y., Coraopolis, Pa., Rock Falls, Ill., Los Angeles, Calif. Additional sales offices at Philadelphia, Detroit, Chicago, Chattanooga, Portland, Seattle. Distributors from coast to coast. By ordering through your distributor, you can get prompt service for your normal needs from his stocks. *Also*—the industry's most complete, easiest-to-use catalog.

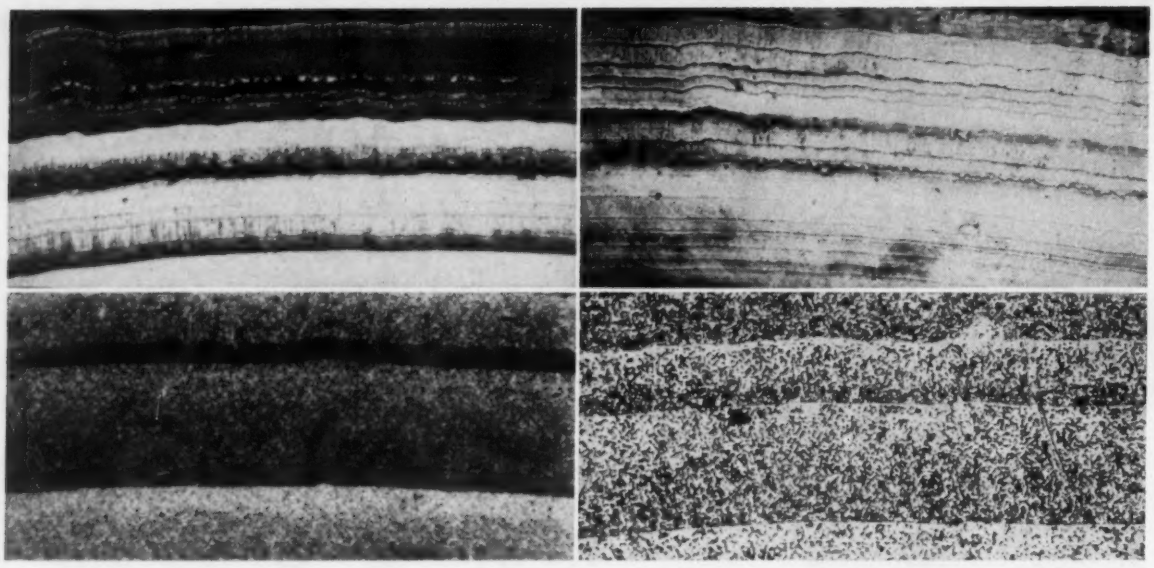


Fig. 1—Photomicrographs of electroless nickel deposits from acid solution. Upper left, nickel as deposited, showing laminations and columnar structure; hardness 500 Knoop. Upper right, after annealing at 400° C for 30 min producing maximum hardness of 800 Knoop. Lower left, after annealing at 600° C for 30 min, showing precipitation. Lower right, after annealing 30 min at 800° C, showing excessive precipitation; hardness 470 Knoop. Photo courtesy National Bureau of Standards

No Electric Current Used in

NEW METHOD OF PLATING

Nickel and Cobalt on Metal Surface

Coating process, called electroless plating—reported in Detroit at the recent American Electroplaters' convention—is brought about by chemical reduction of a nickel or cobalt salt with hypophosphite in hot solution. Latest methods of bath purification among other topics discussed during the society's 34th annual meeting

NEW method of plating nickel and cobalt on metal surfaces without the use of electric current was reported among the technical papers on plating developments presented at the 34th annual convention of the American Electroplaters' Society, Detroit. The convention also sponsored an industrial finishing exposition where many nationally known manufacturers exhibited the latest developments in equipment, materials, services and processes for industrial finishing operations.

Process for plating nickel and cobalt on metal surfaces without the use of electric current was developed by Abner Brenner and Grace E. Riddell of the National Bureau of Standards, and is known as "electroless plating." Coating process is brought about by chemical reduction of a nickel or cobalt salt with hypophosphite in hot solution. The reaction is catalytic, and under the prescribed conditions of concentration and pH, no plating occurs unless certain metals, such as steel or nickel, are introduced in the bath. The reduction then occurs only on the surface of the immersed metal, producing an adherent coating of 93 to 97 per cent purity.

Photomicrographs of deposits obtained by electroless plating are shown in Fig. 1 and evidence both a lamilar and a columnar structure, similar to bright nickel electrodeposits. The deposits produced are of good quality—sound but brittle, and usually are bright. Since they can be made as hard as tool steel, the method may prove useful where hard wear resistant surfaces are required, as in bearings. The process is particularly applicable to the plating of recesses, irregular-shaped objects, and enclosed areas such as tubes, where a centered internal electrode with special current leads would be needed in the electroplating process.

Equipment for electroless plating is simple and more easily assembled than that required for electroplating. No gen-

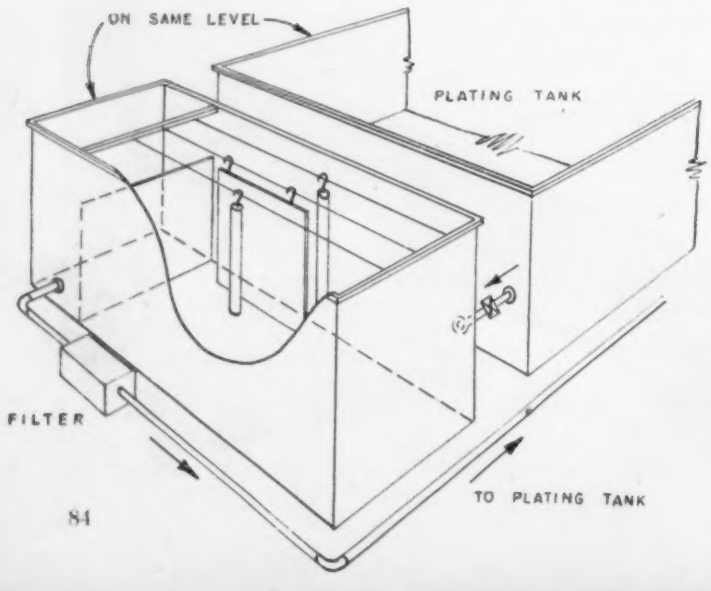
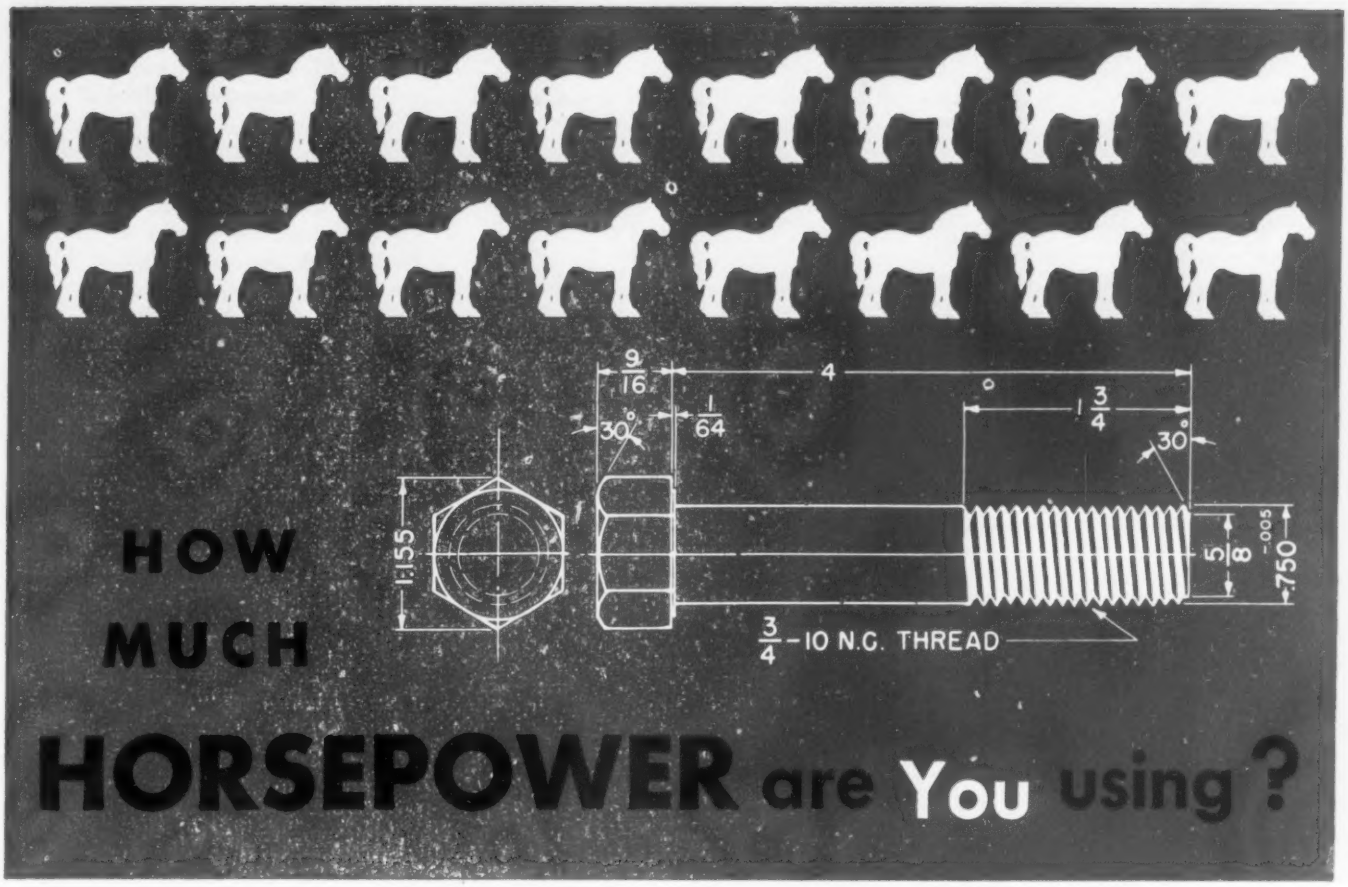


Fig. 2—Recommended design for electrolytic purification to be incorporated in a new plating installation. Photo courtesy Hanson-Van Winkle-Munning Co.



This ¾ x 4" Cap Screw is machined entirely with carbide cutting tools except for the high speed steel Chasers in the die head. *Total time per piece is one minute.*

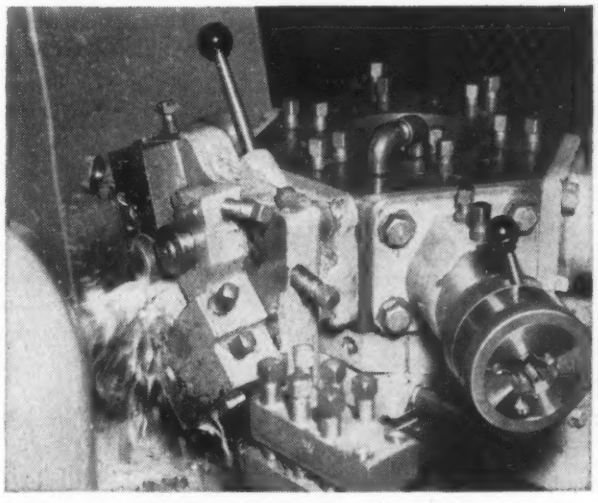
Here is a typical example of the effective use of carbide cutting tools on a Jones & Lamson No. 3 Universal Ram Type Turret Lathe. The depth of the main turning cut is less than ¼". *Yet the single carbide turning tool creates a load in excess of 16 horsepower.*

Of course, we know this simple, ordinary job would normally be routed to an automatic. But we put it on a Turret Lathe to give you, *a practical, simple example of the horsepower required for effective turning with Carbide tools.*

Our folder "One a Minute" describes this operation in detail, and contains vital information for anyone contemplating the purchase of a Turret Lathe, the general use of carbide cutting tools, and greater efficiency in metal turning.

Send for this folder. Or better yet, telephone or write for a Jones & Lamson engineer who will be glad to consult with you on all phases of your metal turning problems.

Jones & Lamson Lathes are designed specifically for the most efficient use of carbide cutting tools.



Spindle speed 1500 RPM Feed .033

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Automatic Double-End Milling and Centering Machines • Automatic Thread Grinders • Optical Comparators • Automatic Opening Threading Dies and Chasers • Ground Thread Flat Rolling Dies

SUGGESTED COMPOSITIONS FOR VARIOUS ELECTROLESS SOLUTIONS

Constituent	Type of Bath: Nickel, Alkaline	Nickel, Acid	Cobalt	Cobalt-Nickel
Nickel Chloride ($NiCl_2.6H_2O$)	30	30	....	30
Cobalt Chloride ($CoCl_2.6H_2O$)	....	....	30	30
Sodium Hypophosphite ($NaH_2PO_2.H_2O$)	10	10	20	20
Sodium Citrate ($Na_3C_6H_5O_7.5\frac{1}{2}H_2O$)	100	....	35	....
Rochelle Salt ($NaKC_4H_4O_6.4H_2O$)	....	....	....	200
Sodium Hydroxyacetate ($NaC_2H_3O_3$)	....	50	....	....
Ammonium Chloride (NH_4Cl)	50	....	50	50
Alkali for neutralizing	NH_4OH	NaOH	NH_4OH	NH_4OH
pH	8-10	4-6	9-10	8-10
Rate of Deposition:				
mm./hour	0.008	0.015	0.015	0.015
in./hour	0.0003	0.0006	0.0006	0.0006
Appearance of deposit	Bright	Semibright	Dull	Semibright

erators, rheostats, special racks or contacts are necessary. Small parts which cannot be barrel-plated economically are readily plated by the electroless process if suspended by a string or in a bag affording ample exposure of the metal surface to the solution. There is no need of constant motion, as in barrel plating, since current distribution is not involved.

While electroless deposits of cobalt and cobalt-nickel alloys are obtained only from ammonical solutions, nickel may be deposited from either acid or alkaline solutions. The reactions, requiring a temperature above 90°C are given in the following equations (in which cobalt may be written for nickel): $NiCl_2 + NaH_2PO_2 + H_2O \rightarrow Ni + 2HCl + NaH_2PO_3$ or $NaH_2PO_2 + H_2O \rightarrow NaH_2PO_3 + H_2$.

First reaction is the important one. It results in the deposition of nickel; the second reaction tends to lower the efficiency of the process through oxidation of the hypophosphite.

Unnusual feature of the electroless process is the catalytic initiation of the reaction by the following metals: Iron or steel, nickel, gold, cobalt, palladium, and aluminum. Unless one of these metals is introduced into the solution, no reaction takes place. Once started, the reaction continues at the metallic surface and only rarely occurs in other parts of the bath. For this reason, the containing vessel must be of glass, plastic, or other noncatalytic material.

Objects to be plated are cleaned by any of the accepted procedures, and are given an acid dip before being suspended in the hot solution. Rate of deposition is about the same as in barrel electroplating, ranging from 0.002 to 0.008-in. per hour, depending on type of solution used. During the process the pH must be kept within a certain range. If the operation is of long duration, the nickel salt and hypophosphite are replenished at regular intervals.

Composition of the electroless plating bath may vary within rather wide limits. Suggested solutions given in above table. In addition to metal ions and hypophosphite, alkaline solutions contain (1) hydroxycarboxylic salts and ammonium salts to prevent precipitation of the metal salts, and (2) certain alkalies to regulate the pH. In acid nickel solutions, organic acids are used as buffers.

Electroless plating on noncatalytic metal surfaces may be accomplished in two ways. If a film of palladium or rhodium of nearly monatomic thickness is first applied by chemical replacement on a noncatalytic metal, deposition of nickel or cobalt will occur on the activated surface. Electroless plating of copper may be carried out in this way. A second method of initiating the reduction is to bring a less noble metal, such as iron or aluminum, in contact with the noncatalytic metal while it is immersed in the hot electroless solution. Once the process is started it continues because of the catalytic action of the initial deposit.

As formed, the electroless deposits are brittle but become ductile when heated. They are harder than the ordinary electrodeposited nickel and, upon heating, their hardness is still further increased. This is in contrast to the behavior of "hard" electrodeposited nickel, which has high initial hardness but softens upon heating. The hardening may be explained as "precipitiation hardening," probably of phosphides.

Adhesion of the nickel deposit to mild steel is such that it cannot be flaked off by bending. However, this property is less satisfactory on high-carbon steel. In salt spray tests on steel coated with 0.0002, 0.0005, and 0.001-in. of electroless nickel, in comparison with simplar panels coated with electrodeposited nickel, the protective value of the two types of coatings was virtually the same. However, the electroless cobalt does not compare so favorably with the electrodeposited cobalt.

Yield or efficiency of the reduction based on the decomposition of hypophosphite is 37 and 66 per cent for nickel and cobalt, respectively. About 2 grams of nickel or nearly 4 grams of cobalt are reduced by 10 grams of sodium hypophosphite. Owing to the moderate yield and the present high cost of sodium hypophosphite, the process is expensive. Thus extensive commercial use of electroless plating, except for special purposes where the cost is justified, is thus dependent on a reduction in the price of this chemical.

Electrodeposits meeting today's requirements keep the problems of purification and control of solutions among the foremost facing the plating industry. Modern applications of electroplating solution purification were presented before the convention by B. C. Case of Hanson-Van Winkle-Munning Co.

About the time that bright nickel plating solutions made their appearance, the plating industry was found with little practical working knowledge of the effect of impurities or the efficiency of the various suggested methods of purification. Platers had a choice of the following methods that worked fairly well in the laboratory. First, chemical precipitation with or without adjustment of pH; second, electrochemical precipitations; third, chlorination; fourth, oxidation by hydrogen peroxide, sodium perborate or potassium permanganate; fifth, occlusion of impurities by precipitates.

Combinations of these methods were sometimes used. The methods were generally used in the scattered cases of severe contamination of standard gray nickel baths with more or less success, but when they were applied to the new bright nickel plating solutions, many disastrous results occurred. Thus, it soon became obvious that bright nickel solutions demanded a much lower concentration of impurities if consistent deposits were to be expected. This indicated that every source of contamination had to be found and removed if possible, even though gray nickel solutions had operated under these conditions. Another result of operating large bright nickel plating solutions was the discovery of the difference in efficiency between the various methods of purification, the amount of time and labor in conducting the purification and the practical aspects when the method was used on large production solutions.

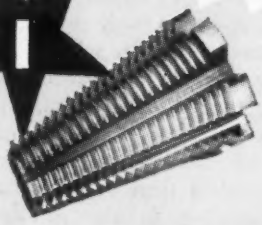
Based on data presented by Mr. Case, lead, copper, zinc, and iron are the most common metallic impurities found in nickel plating solutions. The most common defect cause by excessive metallic contamination in bright nickel solutions is a loss of color or darkening of the nickel deposit in the low current density recesses. Black streaks, black pits or gray deposits in all current den-

5 Star FEATURE

of the MACHINE TOOL SHOW

Be sure to see Continental's display of standard and special cutting tools when you visit the Machine Tool Show at the Dodge-Chicago Plant, September 17 to 26. Continental Tool Works, a division of Ex-Cell-O Corporation, has been designing and manufacturing cutting tools for American industry for 28 years. Watch Continental's precision-made cutting tools in action on metal-working machines when you visit the Ex-Cell-O booth (No. 518) at the Chicago Show.

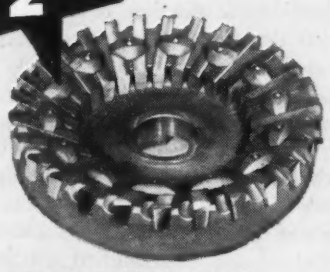
1



CONTINENTAL THREAD MILLING CUTTER

This special thread milling cutter was made by Continental for milling carbon electrodes.

2



CONTINENTAL FACE MILLING CUTTER

This standard cutter has blades placed either radially in the face of the cutter body or in the periphery of the body.

3

CONTINENTAL CARBIDE-TIPPED CUTTERS

Roughing and finishing doming cutters for aircraft cylinder heads.

4

CONTINENTAL PRECISION BROACH

Involute Spline Broach. Continental makes all kinds of round, square, rectangular, spline and insert-type broaches.

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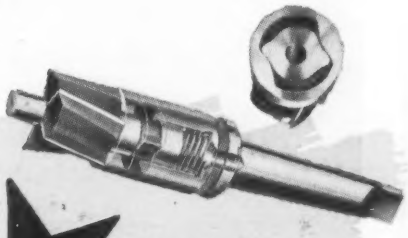

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sity ranges are other noticeable effects of foreign metals. Loss of ductility of the deposits is most noticeable with iron. The bent cathode or Hull cell tests are the most reliable to show presence of small amounts of metallic impurities. The bent cathode using solution agitation is probably somewhat more sensitive in showing the presence of very small amounts of metallic impurities.

When maximum area of properly-shaped cathodes are used with proper agitation and current density, rapid purification from metallic impurities by electrolytic methods can be expected. While research shows that each of the four metal contaminants has a set of conditions that produce the most efficient removal by co-deposition, the small sacrifice in individual rates of removal are greatly overshadowed by removal of all four metals at one time. The two conditions that can be varied in practice are the current density and the agitation.

In practice the operating pH and the operating temperature of the nickel plating solution are not changed. It is impractical to remove any moderate amount of the four metals by low current density electrolytic purification without some sort of agitation. A cathode must be used giving the proper current density ranges for the combination of metal impurities present. Copper and lead are know to plate out satisfactorily at about 2 to 4 amp per sq ft, with zinc and iron coming out better at 6 or 7 amp per sq ft. By using a cathode having symmetrical variations in recesses and high points, and using an overall current density of 5 amp per sq ft, the proper current density requirements for all four metals can be satisfied.

Practice shows that the ordinary corrugated black iron sheet makes a most satisfactory cathode for this method of purification, involving all four metals named. When an overall current density of 5 amp per sq ft is applied to this corrugated type of cathode, the copper and lead deposit out in the recessed areas and the zinc and iron will deposit out on the high points.

Continuous Purification Method

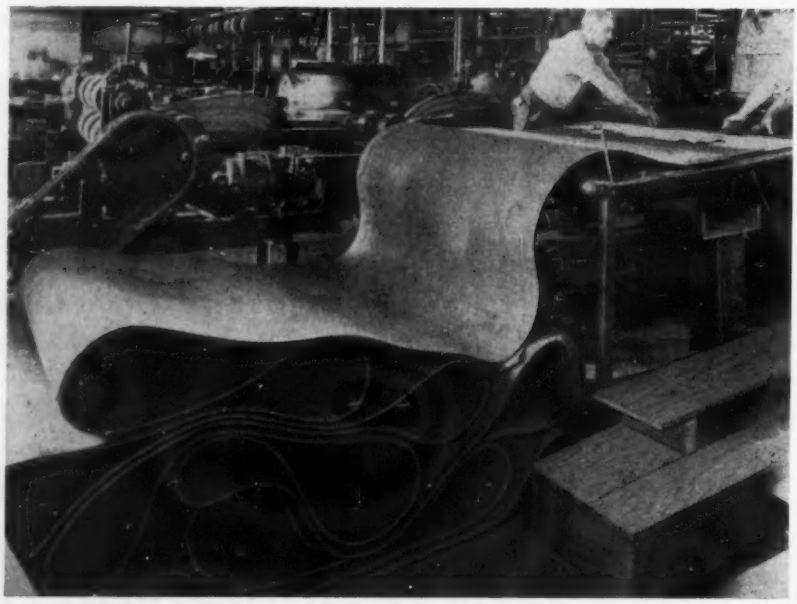
It was pointed out by Mr. Case that as the working knowledge of purifying plating solutions developed and the needs to be fulfilled were understood more thoroughly, it was a logical step from batch purification to continuous purification methods wherever feasible. Amount of continuous electrolytic purification per gallon of solution required to insure a sufficiently clean plating bath was computed by recording the time of each purification and the frequency of these treatments on several bright nickel installations. After completing such studies it was found that if the purification tank was designed so that 0.05 amp hour per gallon of solution per hour of operation were provided, the worst cases of metallic contamination would be kept under control. On this basis a 1000 gal bright nickel solution would require 1000 x 0.05 = 50 amp flowing to the purification tank. Thus, recommended current density of 5 amp per sq ft means that the tank should contain 10 sq ft of properly shaped cathodes. It was also established that if the rate of flow through the purification tank was one third to one half of the total plating solution per hour, the system would then keep the plating bath free from harmful concentrations of metallic impurities.

Numerous designs for continuous purification tanks were developed and used with existing equipment or in conjunction with new equipment. Shown in Fig. 2 is a recommended design to be incorporated with a new plating installation. The purification tank is placed on the same level as the plating tank. A large connecting pipe or hose with a valve between the purification tank and the plating tank is the inlet to the purification tank. Solution flow through this large diameter connecting pipe is by gravity. The size must be sufficient to produce the proper rate of flow. For most efficient operation only a 1 or 2-in. head between the two solution levels is necessary, and if the connecting pipe is of the proper size this small head is sufficient to produce the proper flow. This design can be used with existing tanks providing there is a large enough bottom opening in the plating tank. This purification system offers an ideally suited place for making additions to the bath because the dissolved additions receive electrolytic purification and filtration before returning to plating bath.

It was pointed out by Mr. Case that organic contamination can produce other effects beside the loss of ductility in a nickel deposit. Lacy pitting, fine pitting in medium or high current density areas, black pits, laminated or spauling deposits and possibly other defects are attributed to organic impurities. Use of activated carbon was recommended for removal of organic contamination. After the presence of organic impurities in the nickel solution is established, a laboratory scale purification test should be made out to determine amount of material and conditions to be used, after which a batch purification of the plating bath is in order. However, it was pointed out that deposits from bright nickel solutions that are subject to continuous purification are much more consistent in quality on a week to week basis because impurities never rise to a point that would adversely affect their physical characteristics.

Recent developments in the use of conversion coatings on zinc were discussed before the convention in a paper by J. E. Stareck and W. S. Cibulskis of United Chromium Inc. Conversion coatings were developed primarily as a means of increasing the corrosion resistance of zinc plated steel. The surface of electroplated zinc can be treated either anodically or chemically in suitable solutions so as to convert a portion of the zinc to the oxide or the chromate or a combination of the two. The solutions used in

(*Please turn to Page* 100)



STEERS TO STEEL: After years of steel mill service, this 72 in. wide, 3-ply leather belt is being repaired in E. F. Houghton & Co.'s Philadelphia plant. Nearly 200 steers contributed their hides to make the belt which is 106 ft long and 9/16-in. thick

In steel plate fabrication, the name of General American means many things.

From the preliminary metallurgical research to the last rivet or weldment, General American brings a vast array of designing, engineering, and fabricating experience to the service of United States Industry.

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GATX GENERAL AMERICAN

Huge Placer Dredges

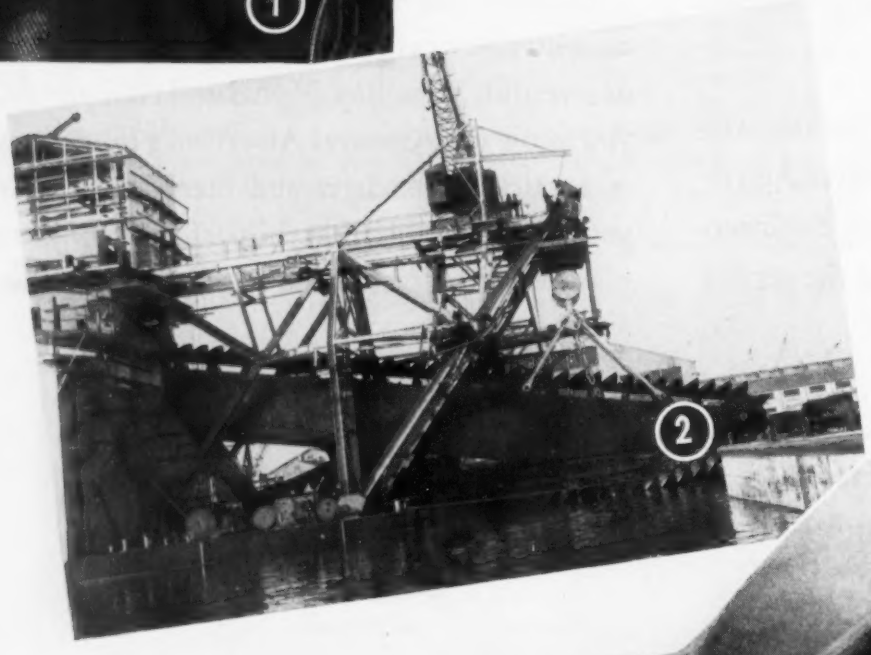
. . . employ 216-ft digging ladder and 148 fourteen-cubic-foot buckets to excavate tin-bearing sand and gravel

TIN-BEARING sand and gravel to a maximum depth of 100 ft below the water level will be excavated off the Dutch East Indies by two huge placer dredges recently completed by Bucyrus-Erie Co., South Milwaukee, Wis., for Mining Equipment Corp., New York. The two identical dredges "Stuyvesant" and "Roosevelt," each displacing 4000 tons are said to be among the largest ever built in the United States.

Welded digging ladder for each dredge is 216 ft long and weighs approximately 650 tons with equipment such as buckets, rollers, idlers and tumblers. Ladder carries an endless chain of 148 manganese steel buckets, each weighing, with bucket pin, 4025 lb and having a capacity of 14 cu ft. Buckets, manufactured by Taylor Wharton Iron & Steel Co., High Bridge, N. J., are actuated by an upper tumbler and driving machinery powered by a direct current motor. Controls designed and built by Ward-Leonard Electric Co., Mt. Vernon, N. Y., are widely used throughout the dredge.

Loads are discharged into a revolving screen 10 in. diameter, 70 ft long, weighing 90 tons and driven by a 72-in. drive roller. Tin-bearing concentrates pass over 24 four-cell Pan American Engineering Corp. primary jigs. Additional jigs further refine concentrates which will be loaded on barges for shipment to refineries.

Hull, superstructure and housing were built by Tampa Shipbuilding Co., Tampa, Fla. This company also assembled and installed the dredging machinery and equipment. All-welded steel hull is 246 ft long, 76 ft wide and 12 ft 9 in. deep. Total length of each dredge over gangway bridge at bow and tailing sluices at stern is 476 ft.



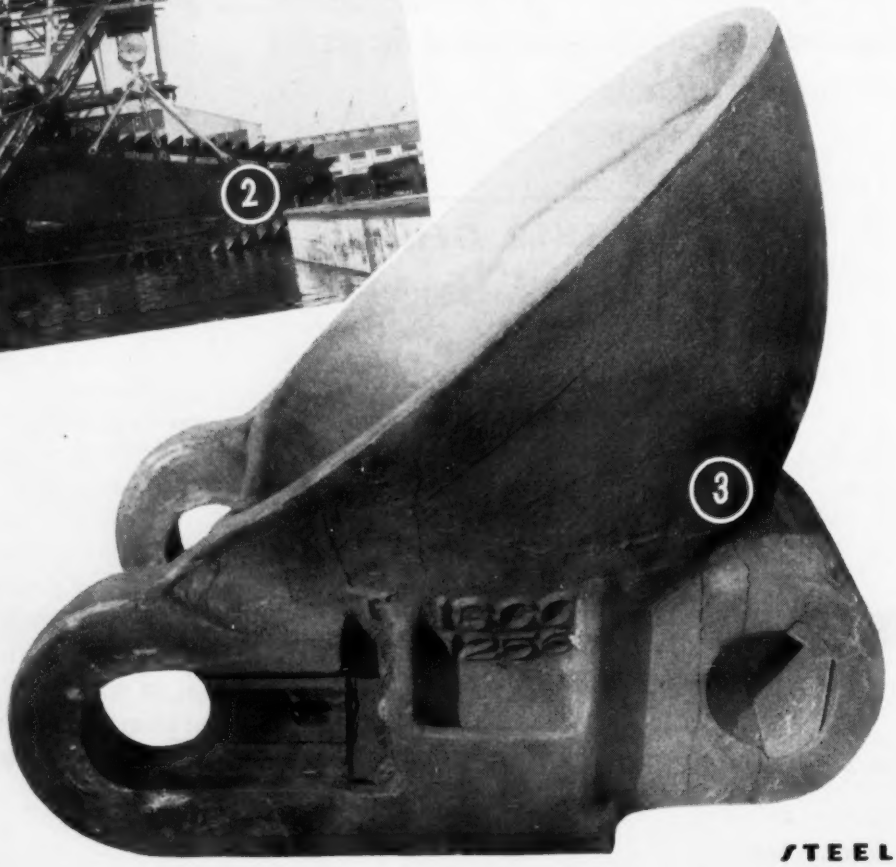


Fig. 1—Control room of the tin mining placer dredge

Fig. 2—Digging ladder of the "Stuyvesant" in position during ladder tests at Tampa, Fla.

Fig. 3—One of the 148 manganese steel buckets, 14 cu ft capacity. Each bucket is cast as a unit with lip integral. As wear occurs lip is built up by welding

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PNEUMATIC TIMER

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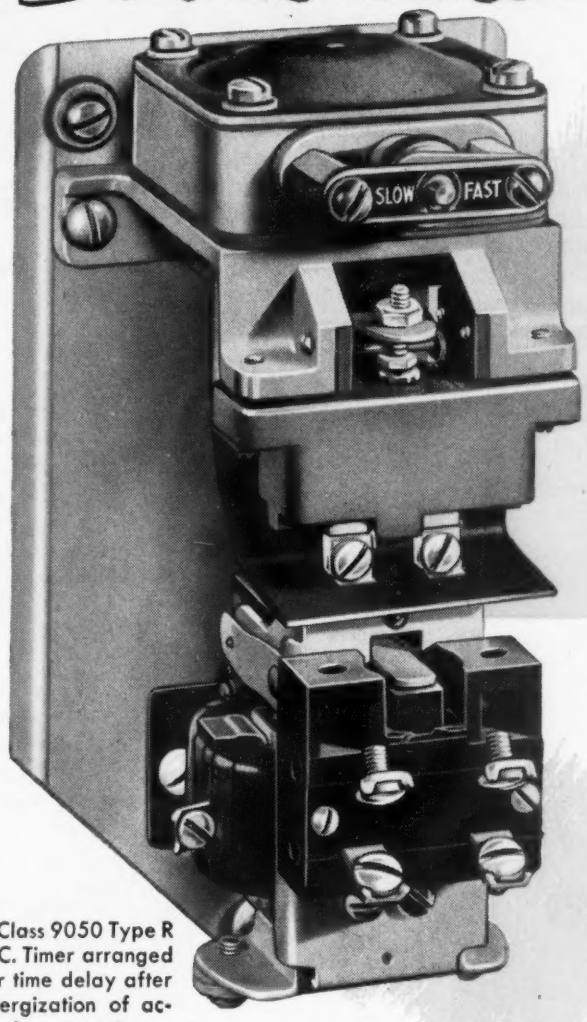


Class 9050 Type R A.C. Timer arranged for time delay after energization of actuating magnet

Addition of a heavy-duty, snap-action contact mechanism, with isolated N.O. and N.C. Circuits, to a dependable timing mechanism, improves performance and broadens an already wide range of applications.

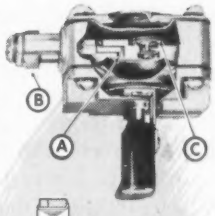
For more than ten years Square D's Pneumatic Timer has been used successfully for timing resistance welds, machine tool sequences, process industry operations and scores of other similar functions. Timing is accurate and easily adjustable.

Two kinds of operation—time delay after either *energization* or *deenergization* of actuating magnet—provide for circuit simplification and greater dependability.

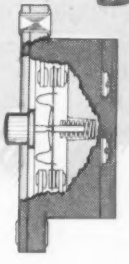
Adjustment is by either a knurled knob, or a micrometer mechanism graduated from 0 to 80. Range is 0.2 seconds to 3 minutes, with accuracy better than ±10%.

Auxiliary Circuits operated by actuating magnet usually eliminate need for additional switching relays.

TIMER OPERATION—Simple operating principle is based on the interval required to transfer a small volume of filtered air from upper to lower chamber through a regulated orifice **(A)**. Rotation of knurled knob **(B)** gives wide range of adjustment. Air returns through valve **(C)** for instantaneous reset.



CONTACT MECHANISM—Has separate N.O. and N.C. circuits with double-break, silver contacts . . . Simple operating mechanism uses alloy springs separate from heavy contact blade which carries current . . . Stainless steel compression-return spring . . . Enclosed in sturdy case of highly arc-resistant melamine . . . Four No. 6-32 binder head terminal screws.



FEATURES

Simple Knob or
Indicating Micrometer Adjustment
Auxiliary Circuits Operated from Magnet

	CONTACT RATINGS						
	A. C. Voltage				D. C. Voltage		
Electrical Ratings	110	220	440	550	115	230	550
Normal Amperes	15	10	6	5	0.5	0.25	0.05
Inrush Amperes	40	20	10	8	—	—	—

Write *for Pneumatic Timer Bulletin 9050. Address* SQUARE D COMPANY, *4041 North Richards St., Milwaukee 12, Wis.*

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Microinch Machine Shops

(*Concluded from Page 79*)

easily understood gaging policy should be based on a thorough understanding of the theory of gaging and also of modern manufacturing practices. The key to perfect quality control has always been a three-point understanding. The machine operator works to component tolerance, the gage-maker works to the gage tolerance and the gage laboratory must measure to an accuracy that is but a small fraction of the gage tolerance.

The advantage of discovering trouble in time, whether it be due to operator, gage or machine, proved an asset whereever the mobile inspection system was established. Bringing a complete inspection department in the form of a small unit on wheels, to all machines on production lines and thereby periodically checking gages and production, is a means of not only detecting hidden errors in production but also of eliminating considerable time formerly wasted under conventional or remote-control inspection procedures.

Advantages of Inspection

Mobile inspection, in relation to surface finish and dimensional control, gives such excellent results that the plan is now being applied to metallurgical control as well. The advantages of continuous scrutiny to detect dimensional, physical and other errors can surely be appreciated. In view of the fact that machine-to-machine inspection has raised the standards of quality control to a new level of efficiency, it seems quite proper to get to the very source of possible errors with "working" gage blocks if gage blocks as a whole are to fill their functions thoroughly.

The notion that gage blocks are too precious or valuable to be handled by any serious machinist or tool maker has long been discredited. All a machine operator needs to know to put "B" blocks to work are the same recommendations given the inspector in the use of his "A" blocks.

Such recommendations are of course modified to some extent. The operator should naturally be taught to handle the blocks with at least the same care he gives a fixed gage and how to ring them in combinations. On the other hand, the operator need not be concerned with the problem of coefficient of expansion because his blocks are 100 times more accurate than a micrometer caliper and no amount of heat will affect the blocks that much. Furthermore, no one can be led to believe that a width or depth of cut or spring caliper can be set to the exact precision of the block or blocks; this could only be possible if the surface finish of work or machine were of the same fine precision as that of the blocks.

It is proper to assume therefore that the only objective in the use of "working" blocks is to make an adjustment, usually in terms of 0.001-in., steel rule or non-graduated measuring tool, positively secure. The average machine operator is trigger-quick to realize that when verifying his settings with gage blocks, he's working to an accuracy of such fineness that even vernier readings are automatically subdivided in several increments. Let's describe the above comparison in this way:

Suppose that two machine operators are given identical requisitions, meaning of course identical setups or adjustments. Chances are 100 to 1 if the settings are derived with any type of "mike" they will vary as much as 0.00025-in. or 0.0000250-in. Based on steel rule measurements the difference could easily be 0.008 or 0.010-in. Now we bring gage blocks into play and the picture is clear, considering the fact that the ratio of accuracy is at least ten to one and 100 to 1 in relation to 0.0001-in. and 0.001-in. respectively. Technically speaking a measurement with gage blocks is no less than 1000 times more accurate than with a steel rule.

"ROLL WELDING:" A block and fall rigged at each end of this 6 in. pipe line being welded with 78E electrodes produced by Air Reduction Sales Co., New York, turns the pipe by unwinding the chain, allowing the welder to work in the flat or downhand position. Result is that speed of operation is increased and the weld is more sound, the company states

In the hands of the machine operator "working" gage blocks have other advantages exclusive of cutting tool and and conventional measuring tool adjustments. Fixed gages are a universal standard of dimensional accuracy control over work in process of production, the fact that such gages are checked several times daily is no absolute guarantee since anything can happen in the intervening periods.

The gage could well be accidentally thrown out of its supposedly fixed accuracy; dropping it on a cement floor could easily alter its dimension 0.0002-in. There is also the immediate possibility of lateral or radial errors developing in some components of the machine. Such errors to the work could result in considerable defective work to escape gaging tolerance due to fluctuations in concentricity or parallelism. These and many other discrepancies can be largely eliminated by more liberal distribution on "B" quality gage blocks around the plant.

One Set for Several Men

Mention of gage blocks in relation to actual production does not necessarily mean every man should be provided with a complete set. Even this suggestion has meaning when it is realized that operators are in many instances now entrusted with special measuring devices costing twice as much as a complete set of 81 "B" blocks.

One set of blocks can serve for six to eight operators or even an entire line, all depending on the extent of production. Quantity production is by no means mass production, if we take it for granted that not more than 20 per cent of all products manufactured come under the heading of mass production. One set of blocks could fill the needs of six automatic screw machine men machining different parts in quantities of 10,000, whereas a tool maker definitely specializing on gages should have his own set.

Once the machine operator becomes competent with the use of "B" blocks, as well as their applications with the holders, a marked improvement will be noted in the quality of his production. Generally speaking, gage block holders are the only related accessories applicable to the machine operators. It is obvious however that such items as master base blocks, master flat, caliper blocks, sine bars, master squares and master parallels are as essential to the tool and die maker or layout man as are the gage blocks themselves.

In conclusion, let it be realized that the more we stress the meaning of microinch precision in industry the closer we come to 100 per cent quality control as scientific means will permit.

The corrosive effect of chemicals isn't just a phenomenon of the process industries. There they know how to handle it, and you'll find mountains of Allegheny Metal equipment doing the job. What's more, the chemists are always coming up with something new, and we're matching them with new developments in stainless or high heat-resistant steels. ● But almost *every* industry has one or more places where chemicals—or perhaps smoke and fumes—are eating the heart out of metals and costs. Those are problems that Allegheny Metal can solve for you, and frequently at little or no added cost. Let our engineers help you work out the answers *now*, because increased supplies of stainless steel are on the way.

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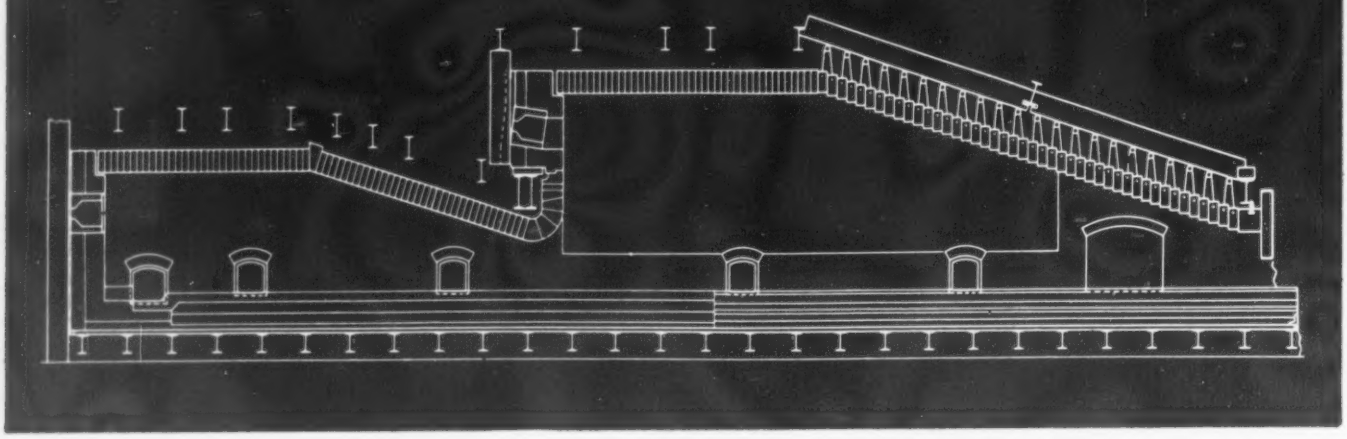
How B&W REFRACTORIES *Lead to Lower Production Costs Under Severe Furnace Conditions*



B&W Refractories used in the construction of this furnace include:

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B&W Plastic Chrome Ore
B&W Light-Weight Insulating Concrete Mix
B&W Smoothset Mortar

In 1942 this gas-fired slab-heating furnace, lined with B&W Refractories, went into service. Through the rigorous war years, and the years that have followed, it has been operating continuously—day and night—often at 10 to 20 per cent over capacity and at high temperatures.

During a recent inspection, it was found that the B&W Refractories were in such excellent condition that long additional service life was predicted.

Increasing production through greater furnace availability, and eliminating excessive maintenance are just two of the many ways in which B&W Refractories are helping to cut production costs for industry throughout the country. Your local B&W Refractories Engineer will be glad to show you how they can benefit you.

R-289

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Internal Fissures

(*Continued from Page* 81)

of analyses in which rolls are made and the wide variety of shapes in which they are cast presented many problems to the adaption of supersonics to roll testing. In its present state, this instrument still requires the operation of a man skilled in the knowledge of rolls and roll production, if intelligent results are to be obtained.

The reflectoscope instrument, Figs. 1 and 2 is used for testing rolls and all manner of smaller metal objects. Construction and operation of this instrument have been the subject of many recent papers. Briefly the supersonic reflectoscope as made by Sperry Products, Inc., Hoboken, N. J., is a testing instrument consisting of a generator, a quartz crystal sound radiating unit, an electronic amplifier, and a cathode ray oscilloscope. The generator supplies an oscillatory voltage to the quartz crystal, thereby activating it so that supersonic wave trains are radiated into the piece being tested. The quartz crystal is also capable of receiving back reflections of these sound waves. The electronic amplifier increases the reflected sound and the oscilloscope measures the time required by the sounds to reach their goal and return to their starting point.

The cathode ray oscilloscope is provided with a fluorescent screen which indicates visually the penetration of the sound waves through the piece being tested as an electron beam sweeps across the screen. This electron beam is set up by the action of electrostatic fields in the cathode tube. The time of travel of the beam across the oscilloscope screen can be adjusted according to the type of material being tested until the best possible results are obtained. The path of this beam across the screen appears to the eye as a line.

In testing, an initial pulse is applied to the crystal which is caused to vibrate for a few micro-seconds. Immediately, sound waves are transmitted through the roll being so tested. If no defects are present the sound waves will travel to the opposite end of the roll. After a certain number of micro-seconds has elapsed, according to the tuning, the current is no longer applied to the crystal which remains at rest so that it may next be activated by the returning sound waves from the test roll. These returning wave trains cause the crystal to vibrate in the same manner as the electric current used to create the initial pulse. This vibration is amplified and applied to the cathode tube which presents its pattern on the oscilloscope screen, thereby representing the interruption of the sound waves in the piece under test. Actually the screen shows the time required for the sound waves to travel from the crystal to the end of the test piece and to return to the point of initial pulse.

Electron flow may be calibrated so that a certain point on the beam will coincide with the time required for the sound waves to travel to the end of the test piece and return. This is done by tuning the instrument using a special test block of known dimensions. Therefore, any reflections on the screen showing between the initial pulse reflection and the point known to represent the end of the roll being tested may be assumed to be internal defects which are interrupting the forward motion of the sound waves and causing back reflection. An experienced operator can identify the nature of these defects according to the intensity of these back reflections.

A standard practice has been developed at the author's plant wherein all steel rolls are tested supersonically for internal soundness before shipment. In order to carry out this practice economically, a tool cut is taken on each end of the body and the wabbler end of the roll is faced off during the rough machining operation. In general, all rolls are checked in this manner. Defects are likely to occur in some rolls, usually rolls having irregular sections (Fig. 4) due to pass design, at certain locations. For rolls of this type special cuts are taken during rough machining to prepare these areas for supersonic inspection. A smooth tool finish is sufficient for all ordinary testing. We have been able to penetrate rolls 18 ft long, using a 110-v power supply. Because of frequent surges in power supply due to shop operations, it has been necessary to use a Sola constant voltage transformer in order to obtain satisfactory readings. For our purpose the following crystals sizes have proved most effective;

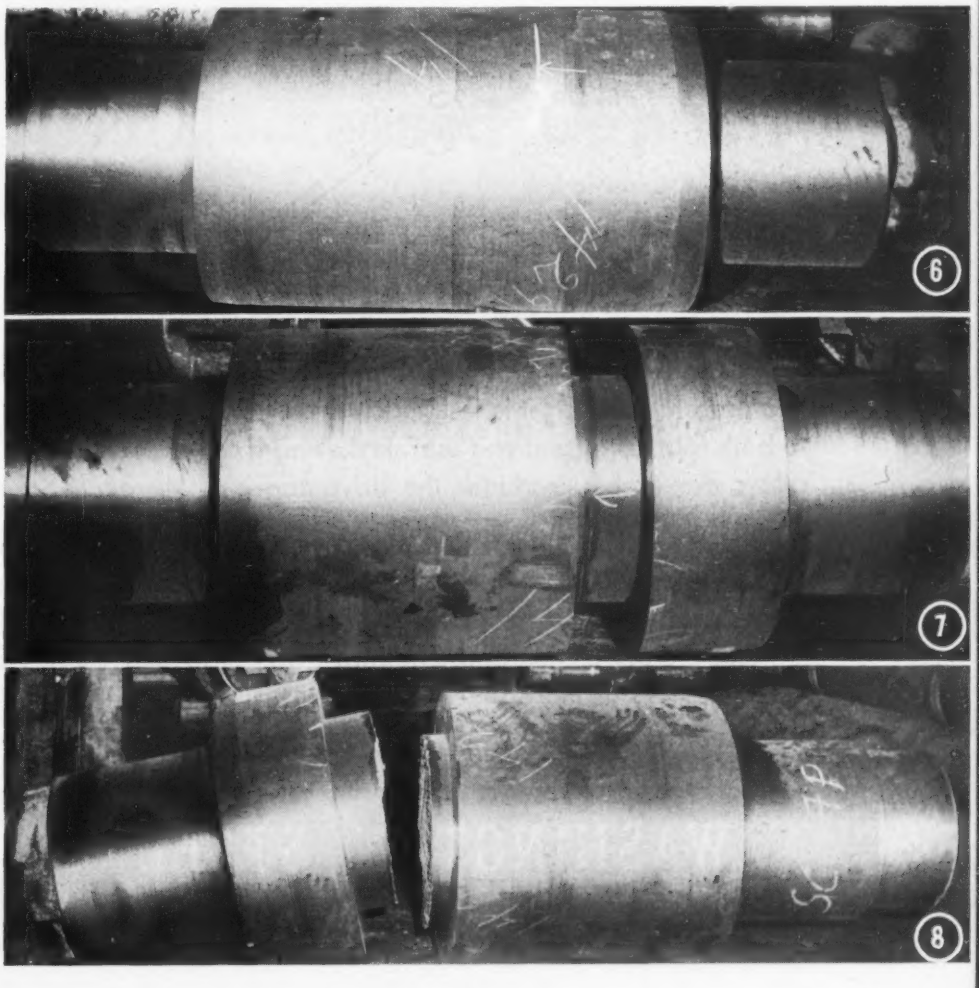
I. 2-in. round—½-megacycle:
This crystal has been particularly effective in picking up the internal fissure type of defect and can be used for rolls up to 18 ft long.

II. 1-in. square—1 megacycle:
This crystal has found many uses in detecting flaws in sections of short distance and is used generally in checking from any areas

Fig. 6—Rough machined roll in condition for supersonic inspection. Arrow indicates where internal defect was discovered by reflectoscope

Fig. 7—Roll shown in Fig. 6 after tool cut had been taken. First visible evidence of defect is the crack shown in bottom of tool cut

Fig. 8—Roll broken at point which had been indicated as defective



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not accessible to the larger 2-in. crystal.

III. 1-in. square—2¼ megacycle: This crystal is used for short distances, such as collar sections on pass rolls.

The reflectoscope is entirely effective in locating internal ruptures in steel rolls. Shrinkage areas can be located in a general way because they absorb the sound waves without giving any indication of their location. Inability to penetrate a roll of such length and analysis that ordinarily would lend itself readily to this type of inspection is a pretty good indication of the presence of shrinkage cavities in the interior. Large fissures cause a back reflection which is easily identified on the oscilloscope screen. Depth of cracks which are apparent on the surface of the roll necks can be determined. This is of great importance in reaching a decision as to whether or not a crack can be repaired.

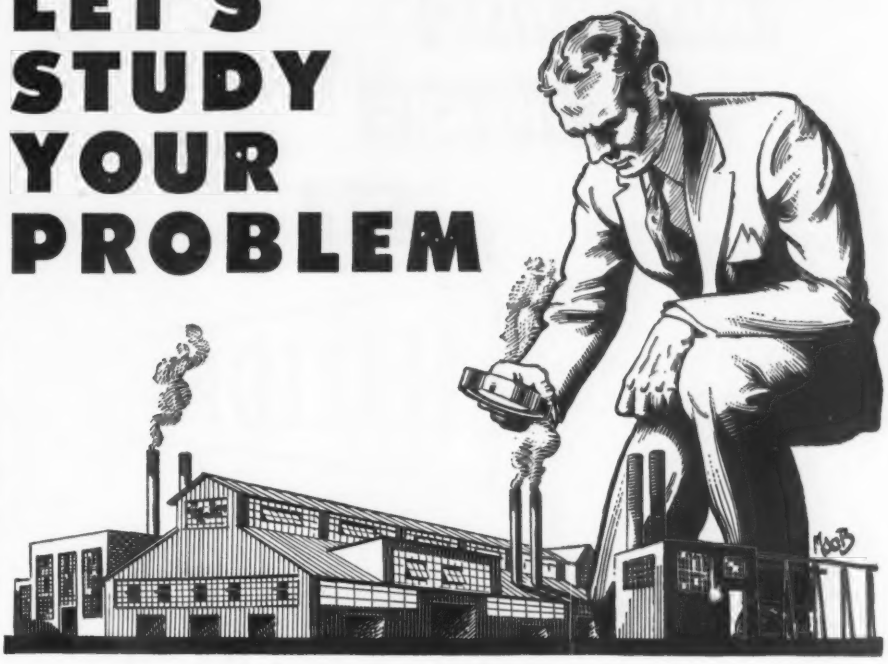
All sizes of rolls having a carbon content not exceeding 2 per cent are tested. There appears to be little difference in their reaction to sound for rolls in this carbon range. However, as the carbon content increases above 2 per cent, the sound penetration capacity seems to decrease rapidly so that at 2.30 per cent carbon, penetration of only 8 ft can be obtained. Up to the present time, we have had little success with the supersonic testing of iron base rolls, although the hope is entertained that in the future a method will be developed for using the reflectoscope instrument on every type of roll used in steel mills.

No doubt further study and practice will increase the knowledge and improve the technique in supersonic testing. Its primary purpose, namely the detection of internal ruptures in large steel castings, has been realized thoroughly. This means of testing is further being employed to detect other types of defects in all types and sizes of rolls with the hope that the breakage of mill rolls because of internal fissure at the time they leave the rollmaker's plant, can be eliminated.

—o—

Best German sheet steel for electrical transformers was produced by the firm of Capito and Klein from steel ingots supplied by Krupp, according to Office of Technical Services, Washington. The steel had a guaranteed energy loss of 0.9 w per kilogram at 10,000 gauss and a frequency of 50 cps. It contained from 4.2 to 4.5 per cent silicon, 0.15 per cent manganese, very small amounts of sulphur, nickel, phosphorus and chromium and no aluminum. Maximum carbon content was 0.1 per cent; 0.06 to 0.08 per cent was considered best, the OTS reports.

LET'S STUDY YOUR PROBLEM



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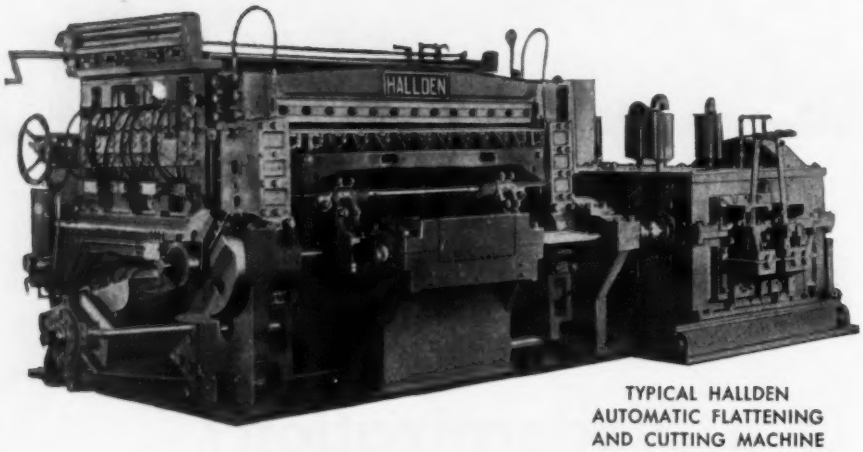

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COMPLETELY AUTOMATIC . . . The metal passes through a series of flattening rolls, each roll driven through a coupling, and it is cut into desired lengths up to an accuracy of 1/64", plus or minus, with a flying shear.

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MINIMUM MAINTENANCE . . . The rolls of the flattener are constructed of alloy chrome steel hardened and ground to a scleroscope of 90, and are easily removed for grinding. The flying shear is a rocker type guillotine design of special alloy welded steel with interchangeable blades. The Hallden Shear is a simple, heavy, rugged machine requiring a minimum amount of maintenance other than oiling under continuous normal operation.

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Tempering Tool Steel

(*Continued from Page 74*)

of 600° F for each steel; zones of maximum hardness are marked in the range of 1000° F for each steel. The slight shift of the zone of maximum hardness to higher tempering temperatures or longer tempering times as the hardening temperature is increased can be observed.

Fig. 3 represents the data obtained for steel R when hardened from its nominal hardening temperature of 2350° F. The individual tempering curves shown all relate to separate and distinct tempering times. To present completely the data obtained, one such set of curves would have to be presented for each quenching temperature employed.

Method of Holloman and Jaffe, however, permits presentation of all of the data from each hardening temperature in the form of a single tempering curve or the presentation of all data for one steel in the form of only four individual tempering curves as shown in Figs. 1a, b and c for steels R, M and N, respectively. This method of plotting the data is based on the fact that hardness is a function of the parameter T (log t/t_o), equivalent to T (c + t), where T is the absolute tempering temperature in degrees R; t is the tempering time in hours, and t_o and c are constants of the steel.

The curves in Fig. 1, therefore, may be termed "master tempering curves" since hardness is plotted against the tempering parameter T (c + log t).

Before assembling all of the data, such as those shown in Fig. 3, into one of the individual curves shown in Fig. 1, it is necessary to calculate and assign a value to the constant c. The actual value of this constant calculated from the data is slightly different for each of the hardening temperatures employed. Calculations based on the use of a c value averaged from the individual values for each steel shown in Table II indicate that the deviations in the master tempering curves are not great.

Therefore, the curves of Fig. 1 have been plotted by using an average c value selected for each steel and assigned to all four of the curves. If it is desired to use the curves of Fig 1 to select individual values of temperature or time of tempering, the c value shown in the caption under each curve should be employed. The individual c values calculated for each steel from each quenching temperature are shown in Table II and the extent of deviation from that selected for drawing the curves of Fig. 4 can be determined by comparison.

There is no consistent trend of the c value with quenching temperature but the c value appears to be slightly higher for steel R than for steels M and N. The

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WARREN, OHIO

c values of 19-20 for steel R quenched from 2350° F have been confirmed by Cohen and Gordon*.

(To be concluded next week).

REFERENCE

*Morris Cohen and M. P. Gordon, "Heat Treatment of High Speed Steel", *The Iron Age*, Feb. 28, 1946—Mar. 28, 1946.

New Method of Plating

(Continued from Page 88)

these treatments are generally of the chromate type, and under certain conditions, the basic chromium chromate is formed along with the zinc oxide or zinc chromate. By varying the solution composition and treatment conditions, coatings ranging from a deep black to a transparent clear film may be formed.

To determine extent to which the conversion coatings increase the corrosion resistance of zinc on steel, a test program to evaluate the corrosion resistance of several types of these coatings was carried out by United Chromium. Conclusions from the data of these tests may be summarized as follows:

(1) The conversion coatings tested retard the formation of white corrosion products on zinc plated steel. In most cases a ten to thirtyfold improvement over plain, electroplated zinc is obtained.

(2) All conversion coatings tested greatly increase protective value of a zinc deposit against rusting of the steel.

(3) Anodic type conversion coatings (such as "Anozinc") were indicated to be better than the dip coatings with respect to retarding white corrosion and improving the protection to the base metal offered by the zinc.

(4) The conversion coatings give the greatest *relative* increase in corrosion resistance on zinc thicknesses of the order of 0.0002 to 0.0003-in.

(5) Zinc deposited from a purified solution forms a conversion coating which retards corrosion more than zinc deposited from a metal contaminated solution.

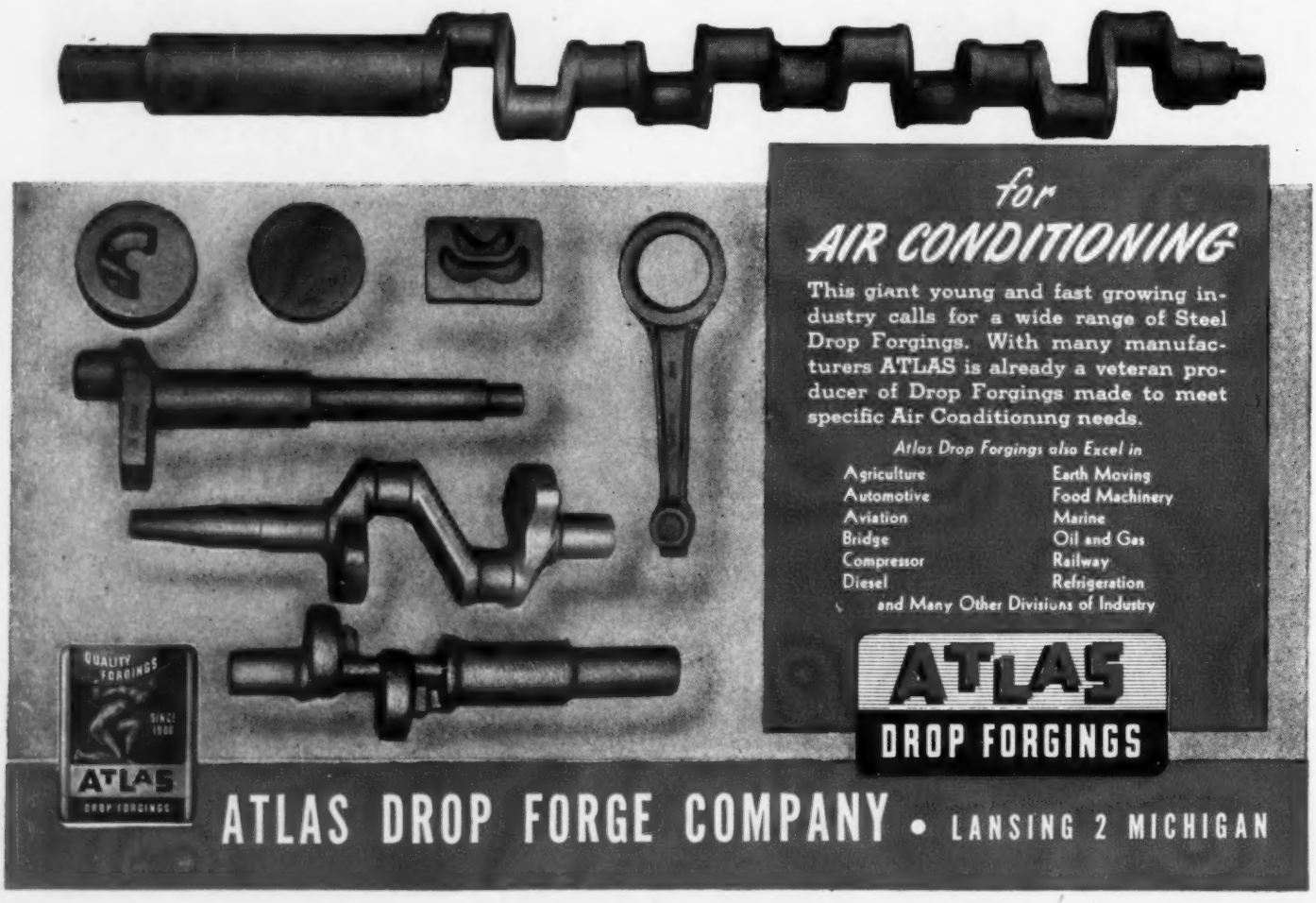
(6) The smoother the base metal, the better the corrosion resistance of the zinc plus conversion coating.

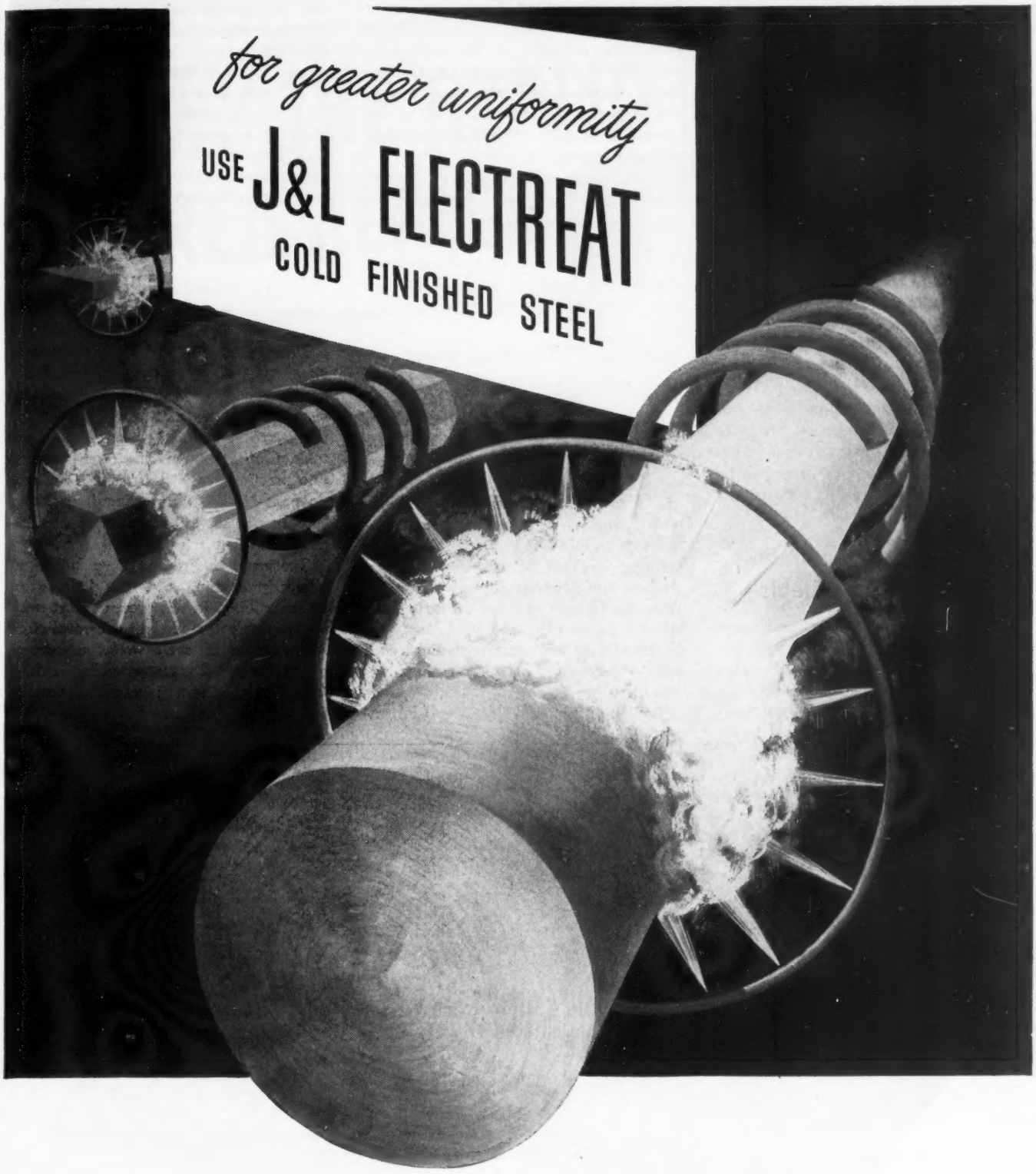
When a simple additional step adds such great increase to corrosion resistance of zinc plated steel parts, it is not surprising to find its adoption spreading widely in postwar industry. Zinc conversion coatings, in addition to offering corrosion protection, are very attractive in appearance. Outstanding in this respect is the clear dip, which when applied over a good zinc plate, looks very much like bright chromium plate.

It was pointed out by Mr. Stareck that probably the largest volume user of the conversion coatings at the present time is the refrigerator industry. The majority of refrigerator shelves manufactured today are finished in clear Anozinc. To obtain maximum abrasion resistance, a clear synthetic organic finish is applied over the clear Anozinc.

There are a number of large automatic installations which are employed in producing refrigerator shelves in the clear Anozinc finish. Peerless Wire Goods Co., Lafayette, Ind., finishes about 16,000 shelves per day in clear Anozinc. At United Steel & Wire Co., Battle Creek, Mich., a full automatic type machine is used which incorporates the clear Anozinc treatment in a cycle that is completely automatic.

Another interesting application is the use of black Anozinc as a corrosion resistant coating as well as a paint base on airplane propellor blades. In addition to the blades themselves, many of the other components of a propellor assembly are finished with Anozinc. Another very good application of this type of conversion coating is on wire screen cloth. Here yellow Anozinc is used very successfully, with the processing done on equipment handling continuous strips of steel wire cloth traveling through the various solutions—cleaning, zinc plating, yellow Anozinc treatment, rinsing and drying. Thus it can be concluded that the potential uses of zinc conversion coatings are very numerous as these treatments enable the relatively inexpensive zinc plate to compete favorably with more





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expensive finishes on either a cost or quality basis.

General subject of physical characteristics of electrodeposits was discussed in several papers. One of these was one entitled, "Stress in Electrodeposits and Its Significance," prepared by K. G. Soderberg and A. K. Graham of Graham, Crowley & Associates, Inc. William Phillips and F. L. Clifton of General Motors Research Laboratories continued the discussion of this general topic with a paper entitled, "Stress in Electrodeposited Nickel." The physical properties of electrodeposited chromium were discussed in a paper by Abner Brenner, Polly Burkhead and Charles W. Jennings of the National Bureau of Standards.

Recent developments in barrel plating techniques for nickel plating were presented in a paper by Henry Strow of MacDermid Inc. Barrel chromium plating was discussed in another paper by G. Dubpernell and S. M. Martin of United Chromium Inc.

Report Evaluates German High Temperature Steels

Specifications for heat resistant steels which were used in German aircraft turbine engines are listed along with other German steels for high temperature applications in the Office of Technical Services, Department of Commerce report which evaluates them in United States standards. According to the 83-page report, PB-50349, many of the German steels described are inferior to comparable American steels and only a few are promising enough to warrant manufacture and testing.

Composition of numerous German nonferrous alloys, most of which are believed to be very similar to selected American alloys, are also listed. Most of the comparisons with American steels refer to the standard steel specification numbers of ASTM or SAE.

Torsional Vibration Book Reprinted by SAE

With 134 full page drawings, charts and graphs, the second printing of the treatise, "Evaluation of Effects of Torsional Vibration" is being made available to engineers, designers and research workers by the Society of Automotive Engineers Inc., New York. Describing methods of reducing torsional stresses, for determining and estimating their significance and for measuring torsional vibration in diesel engines, the book, now in its second printing, contains 576 letter size pages, with photographs.

Presenting reports of field and laboratory experiments and short-cuts to cure vibration difficulties, it discusses relationships between nominal and actual stresses and reviews practical methods of determining stress concentration factors. The appendix presents specifications of torsional vibration equipment and Navy recommendations for submitting torsional vibration data to governmental procurement agencies.

Threading

(*Continued from Page* 78)

"snap," precision and dependability into restricted space was an invaluable asset.

During a recent visit with a maker of opening dies and collapsing taps, I became convinced that no machine tool elements have to pack so much of everything into such small space as do these tools. Carbide-tipped chasers are coming into practical use in this field. They will do much to keep threading from being "the longest single operation" of a multiple machining setup.

The same things that have helped in chaser production also are helping in thread milling. In this process, short work is completely threaded in one revolution. An example of such work, as accomplished in a Hall planetary miller, is illustrated on the third page of this article. In this setup the internal threads and also

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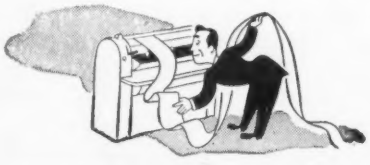

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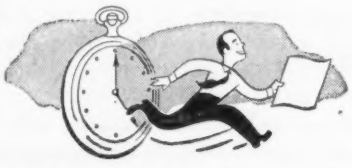

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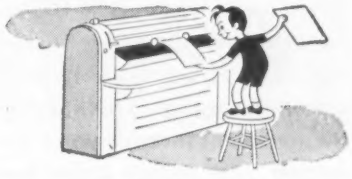

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the shrink band in a Pratt & Whitney aircraft engine cylinder head are milled to close limits—all at one setting.

It is a far cry from the days when practically all threading was done in engine lathes to this day and age when threading is done in at least 25 different kinds of machines ranging all the way from turret lathes to centerless grinders.

The discovery (or invention) of the centerless grinding method of threading all sorts of "headless" screws— including hardened steel set screws—can be classed as one of the most interesting postwar achievements in machine shop practice. It is closely tied up with the development of crush dressing of grinding wheels, for hardly in any other way could the required multi-ribbed helical form be achieved on the centerless thread grinder cutting wheel.

This threading method must be seen to be appreciated. The usual question inspired by a demonstration is "Why didn't someone think of that long ago?" What seems obvious *after discovery,* remained well hidden before. That is what keeps inventors inventing. There are lots more things still left for them to invent—which should make us hopeful for the future of this country.

Conventional thread grinding, that is with work held between centers, originally was done as a tool room operation for precision finishing of thread gages after hardening. Prior to hardening they had been lathe-threaded closely to size. My first contact with grinding as an out-and-out thread cutting process was about the time of World War I, in connection with Bath ground taps. These were ground from solid, hardened blanks by a process which at that time was pretty much of a secret.

About 1920 I saw my first thread grinding machines, when Ralph Flanders allowed me to go behind the scenes in his ground tap shop in Springfield, Vermont. Those little bench-type thread grinders were forerunners of the large automatic thread grinders which for several years now have been an important part of the Jones & Lamson Machine Co.'s line of standard production machine tools. I doubt whether even Ralph Flanders foresaw the shape of things to come, back there in 1920.

The illustration on the right hand page of the spread at the beginning of this article, shows a modern version of Ralph Flanders' machine grinding an index worm for a helical gear generator, using a diamond-dressed, single-rib wheel. This worm has an outside diameter of 10 in. and is 12 in. long. Very small work can be handled in this same machine.

Crush dressed, multi-rib wheels now are being applied to thread and form grinding in machines similar to this and made by a number of machine tool builders. Thread grinding today ranks with other methods as a production process on ordinary materials, and is definitely in a class by itself of "unmachinable" materials. Its advocates believe that the surface of its possibilities only has been scratched. That may well be true—if grinding history repeats itself.

Improvements in solid taps—including those with ground threads—have made possible multiple tooling such as that illustrated in the picture at the lead of this article. This General Motors setup in a vertical, adjustable center multiple spindle machine would not be an economic success with taps of 25 years ago. They just couldn't take it at the speeds now employed. Obviously one broken tap ties up the whole job. They must stand up—and they do. This setup actually is simple as compared to many involved in station-type machines used on automotive and aircraft work.

Another development which can be credited to World War II aircraft manufacture is the controlled lead precision tapping machine shown at the lower right of the left hand page of the two-page spread. This machine, originally developed by H. F. Bakewell on the west coast, now is manufactured in improved form by the Warner & Swasey Co. It handles work to class 5 tolerance at production speeds.

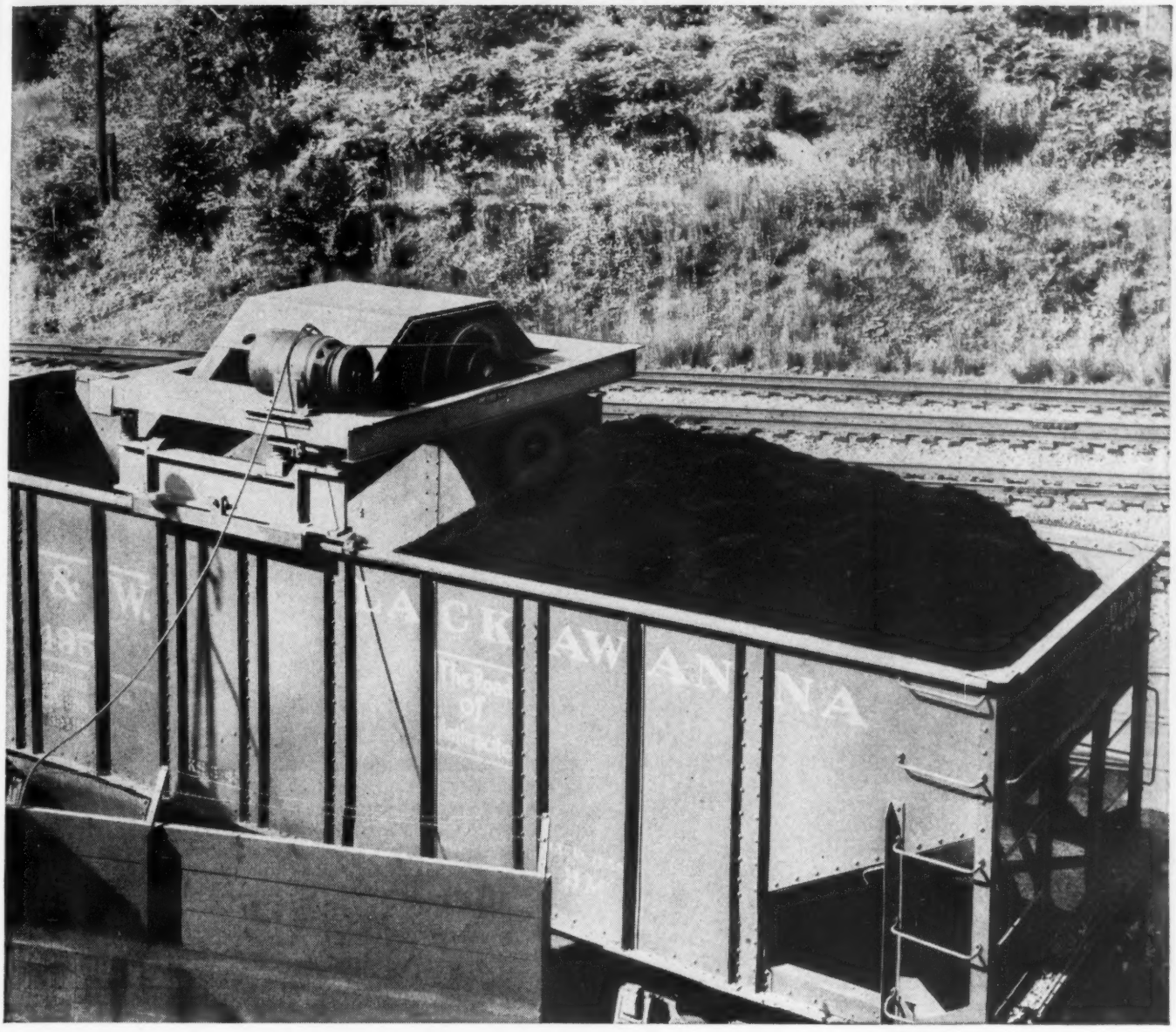
Above the tap is a hardened and ground lead screw, clamped between brass guide fingers. This lead screw also is a hob which cuts the thread forms into these brass fingers. The lead screw gives positive, accurate, smooth feed to the tap—thus taking the feed load off that tool. In case of an obstruction, a clutch slips, preventing tap breakage.

There certainly is nothing static about the technique of threading. Thirty years ago automatic screw machines had screw production "in the bag." Today they are used for purposes then undreamed of—but not generally for conventional nut, bolt and screw production. When thread rolling began to edge in, no one dreamed of centerless grinding as a competitor on screw threading. It's a fact that the thread gages of yesterday were not as accurate as the best commercial threads of today.

One thing is certain. "Over the hill" lie unknown factors which in turn will obsolete many things we now think are the last word.

—o—

Designed with an internal nozzle mechanism which automatically removes any dry ice formation from the seat, a carbon dioxide gas pressure regulator which works continuously without freezing is a development of Victor Equipment Co., 844-54 Folsom street, San Francisco. Regulator is designated as Model C 10.



Great shakes for stubborn coal

That's what users the country over say about the Robins Car Shakeout.

No matter how stubborn coal tries to be, the Robins Car Shakeout shakes it loose . . . unloads the car "broom-clean."

Fifty- or seventy-ton hopper cars are emptied in as little as 90 seconds . . . as much as twelve times faster than manual unloading!

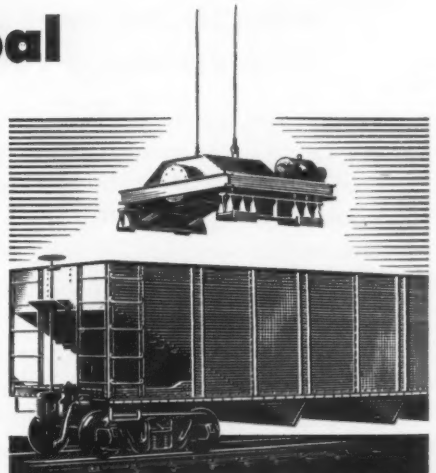
And it's simple to operate. Just lower it onto the car. Press a button. And the Shakeout does the rest. It loosens coal even when it's tightly packed or frozen . . . lets it flow freely and quickly through the hopper doors of the car.

Contrast this with the old-fashioned and costly manual method of car-unloading which often required as many as six men to empty one car.

Quick, efficient unloading with the Robins Car Shakeout will enable you to get coal cars off your siding in a hurry . . . will help eliminate demurrage charges.

Actual field operations by scores of users prove that this new, portable unit does a thorough job with complete safety to the operator . . . with no damage to the cars.

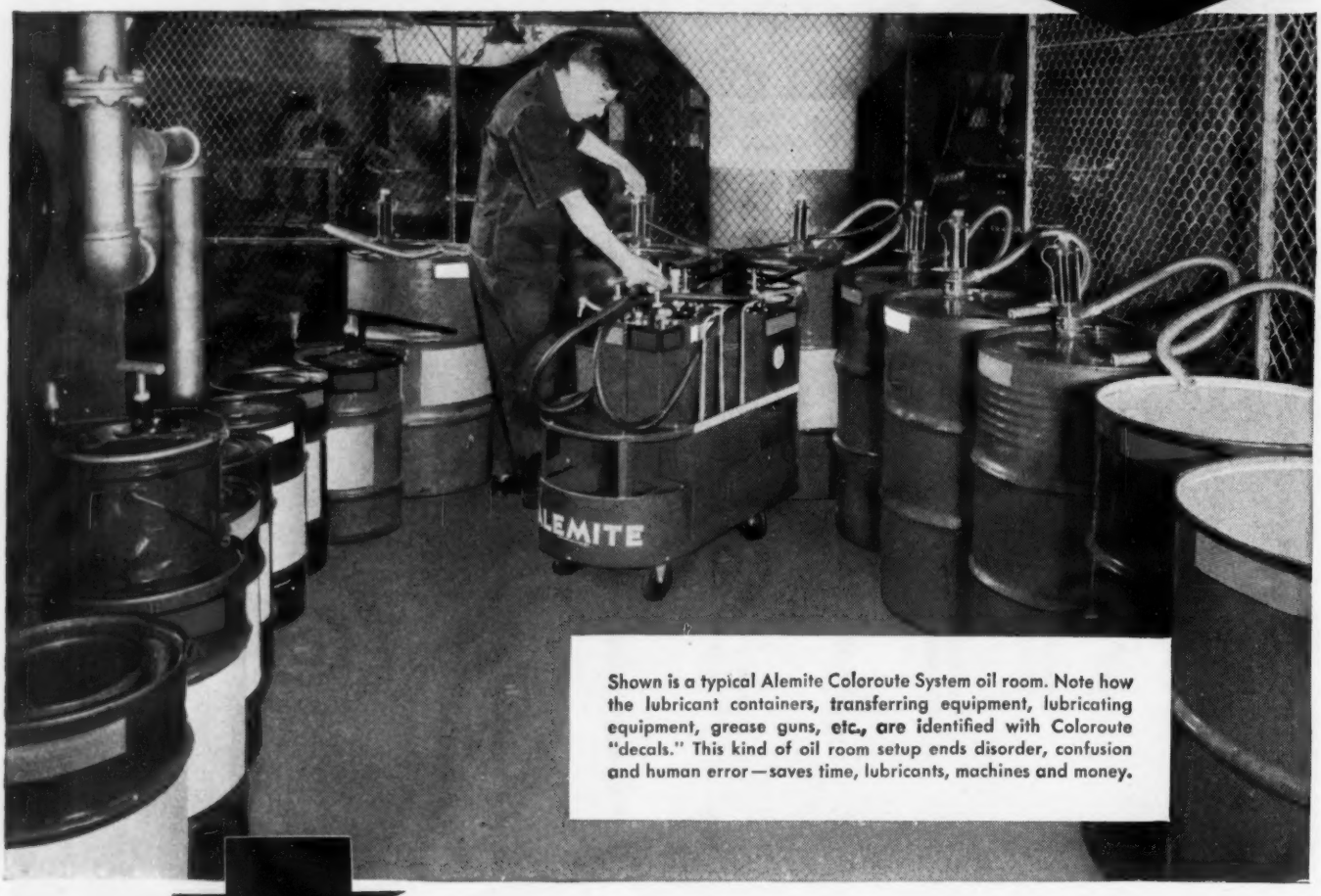
Write for this new booklet about the Robins Car Shakeout. It tells you how to save time, money and manpower.



ROBINS CAR SHAKEOUT

ROBINS CONVEYORS DIVISION, Hewitt-Robins Incorporated, Passaic, N. J.

Good Lubrication starts with an orderly oil room like this



Shown is a typical Alemite Coloroute System oil room. Note how the lubricant containers, transferring equipment, lubricating equipment, grease guns, etc., are identified with Coloroute "decals." This kind of oil room setup ends disorder, confusion and human error—saves time, lubricants, machines and money.

YOU CAN CUT PRODUCTION COSTS BY MODERNIZING YOUR OIL ROOM

For the price of a 3 cent stamp, you can have the kind of oil room that takes all the guess work out of lubrication. You'll know for sure that the right lubricant will go where it's supposed to—that you'll have a ship-shape lubrication job down to the last machine.

Here's all you do. Make a check on your oil room right now. Then, think how much more efficient a new arrangement would be—how much an identification system would help to eliminate errors. Tell us how many types of greases and oil you use—or the number of "decals" you want. Give us the approximate number of containers, lubricating equipment, guns and other items you use.

Here's what Alemite will do. Fill in the coupon with the full information. We will then send you the Coloroute "decals" you need along with suggestions on how to design and operate an orderly oil room.

You buy nothing. This is simply Alemite's way of helping industry cut production costs through improved lubrication.

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REG. U.S. PAT. OFF.

Another Product of STEWART WARNER

Alemite ALONE *Combines all 3 in Lubrication*

1. EQUIPMENT 2. PROCEDURES 3. LUBRICANTS

WE'LL HELP YOU GET STARTED

Mail Coupon Today for Free Booklet and Alemite Coloroute "Decals"

Alemite, 1879 Diversey Parkway, Chicago 14, Illinois
Please send *Free* booklet and . . . Alemite Coloroute "Decals." (Indicate quantity you need.)

Company .....
Name .....
Address .....
City ..... *State* .....

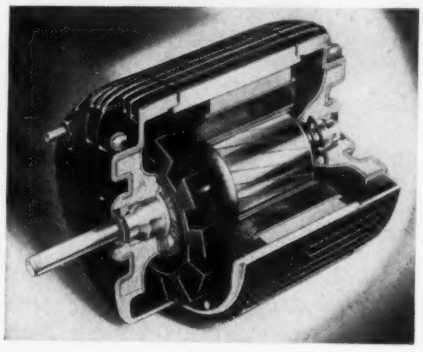
New Products and Equipment

Additional information on the new products and equipment described on this and succeeding pages may be obtained, without obligation, by checking appropriate numbers on the cards following page 110

1. Fractional HP Motor

A 1/20-hp, 4-pole, shaded pole, totally enclosed alternating current motor, designed for continuous fan duty at 1500 rpm is an addition to the motor line of Redmond Co. Inc., Owosso, Mich. Named MocroMotors, they have 2 sq in. of bearing surfaces with individually fitted bearings, spaced 5 in. overall and 6 cu in. total volume in oil reservoirs.

Circulating lubrication permits continuous operation in any position for un-



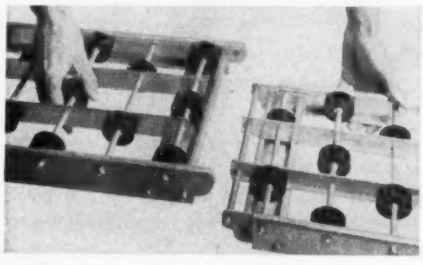
limited periods. Features include: Lubricated silent thrust washers; flush-weld precision skewed rotor; humidity and oil resistant windings; controlled end play; die cast machined frame; 198 sq in. of cooling surface; and internal air circulation.

2. Flexible Metal Hose

Development of a 1/8-in. diameter flexible metal hose is announced by Pennsylvania Flexible Metallic Tubing Co., 72 Powers lane, Philadelphia 42. The interlocked hose is produced in diameters up to 30 in. ID for use in industrial recording instruments. It is made of bronze steel and various alloys in lengths up to 100 ft.

3. Wheel Conveyor

With no sharp corners or projections to tear or damage packages or injure personnel, the Arr-O-Lite wheel conveyor, offered in 12-in. wide, 5 and 8 ft

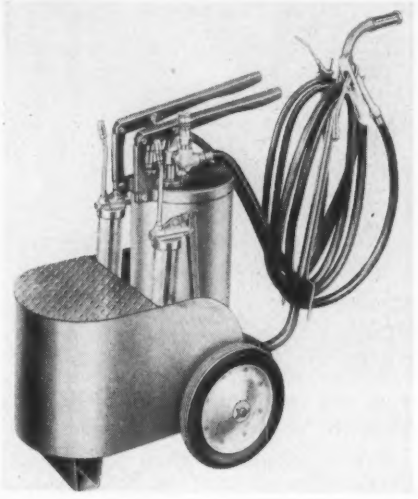


long sections by Arrow Products Inc., Grand Rapids, Mich., has an operating capacity of 50 lb per foot. Conveyor wheels are of corrosion resistant plastic, free-running and noiseless.

Wheel bearings are of antifriction type, also corrosion resistant and practically dirt proof and require no lubrication. All straight sections are equipped with a self-locking hook and bar type couplers. Parts of conveyor are die formed and interchangeable from one section to another.

4. Lubrication Cart

Carrying a generous supply of three different lubricants (two greases and one oil), an industrial lubricating unit for plant-wide use which requires no utility connections, is announced by Industrial



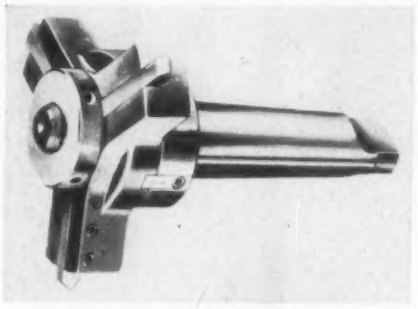
Division of Gray Co. Inc., Graco square, Minneapolis 13. Lightweight, portable, one man operated cart is mounted on two semipneumatic tires.

Two 1 lb lever guns and one 1/2-pt pistol oiler are included. Pressure lube pump has a built-in gun loader for hand guns. Lube and oil compartments are easily filled without removing pumps. Front section of cart is a large tool box with hinged lid which also serves as a platform step to reach high bearings.

5. Boring Head

Designed for repetitive boring operations, the Kwik-Size boring tool manufactured by Kaukauna Machine Corp., Kaukauna, Wis., provides efficient and economical boring on any run of more than three pieces, it being possible to rough, semifinish and finish bore without changing cutter bits. To do this, the boring head which is mounted on an eccentric arbor is indexed for individual cuts.

Uniformity of bore size is assured as head is locked in position after each indexing. Tool is used for stub bar boring only. Either carbide cutting tools or

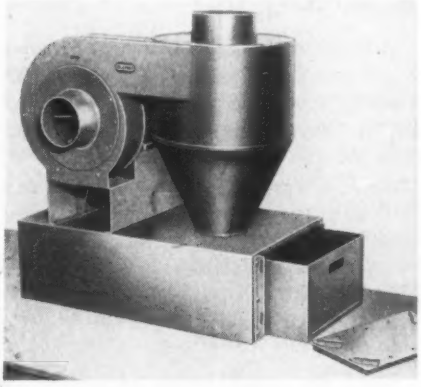


high speed steel bits may be used. Tools have No. 5 Morse taper shanks.

Using 3/8 x 3/8-in. tool bits and different diameter heads, it is possible to bore any size holes from 4 to 8 1/8-in. diameter. Heads are interchangeable on the eccentric arbor so that cutters may be set in advance for various bores and counterbores. Fit may be adjusted in each size head to give a range of approximately 3/8-in. variation of diameter.

6. Dust Collector

Designed for collecting dust, lint and dirt from heavy duty polishing, grinding and buffing work in those states where



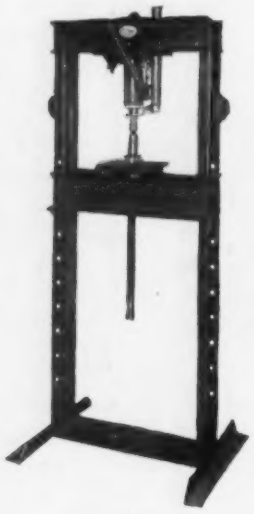
outside exhaust is mandatory, the model 11N50 Dustkop, made by Aget-Detroit Co., Main & Washington streets, Ann Arbor, Mich., has a cyclone separator provided with a stack connecting sleeve so that piping may easily be installed to convey cleaned air out-of-doors.

Powered by a 1 1/2-hp, continuous duty motor, direct driving paddle wheel,

self clearing fan, the unit develops in excess of 1500 cfm at 3.2 in. static suction on a 6 1/2-in. diameter inlet. Removal of collected dust is by means of a dust drawer in base of collector. Floor space required is 20 x 36 in. and overall height of unit is 35 in.

7. Power Press

A feature of the 8 and 20 ton hydraulic power presses made by Aristo Power Tools Inc., 601 West Washington boulevard, Chicago 6, is the removal of the



power unit for use as a portable lifting jack. The smaller press incorporates an 8 ton Blackhawk jack, designed for inverted operation in the press and which can be removed in 30 sec.

Both presses have arc welded frames capable of withstanding 20 and 50 ton loads respectively. The 20-ton Porto-Power unit may be used for a wide variety of lifting, pulling, pushing and clamping operations.

8. Drafting Tray

Affording the draftsman or designer a spacious easily accessible place for all working tools, the drafting tray offered by A. Wayne Nunemaker & Associates, 103 South Wells street, Chicago 6, "floats" above the working surface and is readily moved to any location on the drafting table. Both height and angle of tray are adjustable.

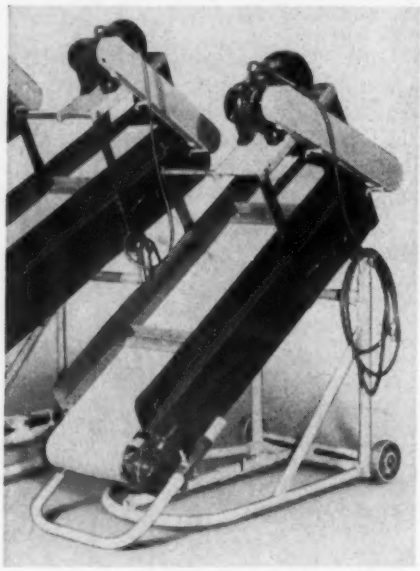
9. Vacuum Flask

Used for shrink fitting of metals, or as the container for the freezing medium utilized with the trap on vacuum pumps, the unbreakable and explosion-proof stainless steel vacuum flasks offered by Scientific Glass Apparatus Co. Inc., Bloomfield, N. J., contain a radiation shield which limits movement of heat rays through the evacuated space.

If punctured or otherwise damaged the flasks are easily repaired. Any gases which might cling to the metal surfaces are absorbed by activated charcoal contained in a section of the evacuated space. Containers are produced in six sizes, ranging in capacity from 400 ml to 50 liters. Largest size is furnished with an extra outer casing equipped with carrying handles.

10. Small Conveyor

Designed for use between punch press machines where space must be conserved, the new, compact Press-Veyor power belt conveyor, made by Rapids-Standard Co. Inc., Grand Rapids 2, Mich., has a bed measuring 4 ft long. To withstand constant abuse in the press



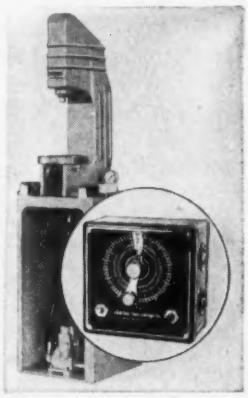
room and on other industrial jobs, it is fabricated of heavy gage formed steel.

Unit is adjustable from a minimum height of 9 in. to a maximum height of 30 in. at the receiving end and from 39¼ to 61¼-in. at the delivery end. It is equipped with lifting handles at both ends. Operation is by a 1/3 hp gear head motor.

11. Press Timing Device

Action of a timing device developed by Air-Hydraulics Inc., 401 Broadway, New York 13, for use on their air hydraulic presses, is reverse under pressure, automatically completing the cycle of each ram stroke after delivering the full predetermined pressure. Without the device the operator must hold down the button until the down stroke is completed. Premature release means application of less than the full predetermined pressure set on the pressure control gage, resulting in loose assembly or other faulty operation.

Illustration shows 6 ton press equipped with timing device and two push button controls. Double controls are a safety feature, requiring both hands in use before starting the ram cycle. Press and timing device may be set for completely automatic multiple cycling in all



types of assembly, forming, marking and other operations. Timer has adjustment for speed and ram well.

12. Variable Pitch Pulleys

Suited to vertical as well as horizontal shaft mountings, a line of variable pitch pulleys, announced by Gerbing Mfg. Corp., 154 East Erie street, Chicago II, maintain a constant centerline and allow use with a V-groove companion sheave, Pulleys are adaptable to standard constant speed motor of 1/3 to 2 hp at 1750 rpm, giving variable speeds within a 3:1 ratio.

13. Feed-Water Controller

Feed-water for boilers is sensitively controlled by a new method embodying powerful and positive magnetic action, developed by J. A. Campbell Co., 645 East Wardlow road, Long Beach 7,

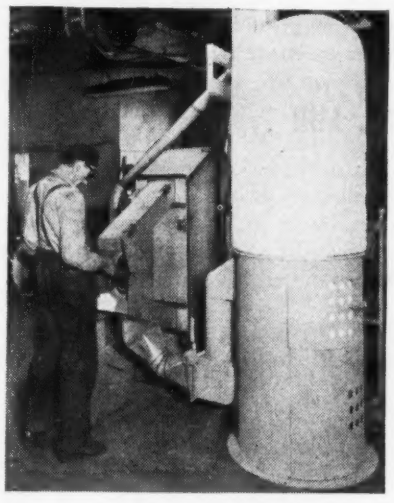
Calif. Known as Micro-Netic electric controller, the unit weighs 7 1/2-lb and may be attached to a boiler to occupy a space 3½ x 7 x ½-in. for its housing and switch box.

Controller embodies a round ball float of Monel capable of resisting a pressure of 400 psi. This float carries a steel ring which attracts the Alnico permanent magnets when the ring comes into their

fields. When level of water in boilers lowers to a predetermined point, the magnetic action opens the water line, closing automatically when the level rises to a certain point.

14. Dust Control Unit

Meeting the needs of both large and small plants where layouts require the placing of one or more machines in buildings not served by a central dust control system, the self-contained dust control unit made by Kirk & Blum Mfg. Co., 2902 Spring Grove avenue, Cin-



cinnati 25, will handle sawdust and shavings, buffing and polishing dirt, etc.

Features include an air volume of 900 cfm at 2 in. suction, capacity for four 3-in., two 4-in. or one 6-in. pipe connections and a 4 cu ft storage compartment. Unit collects heavy dust and a high percentage of fine dust automatically and collects the small percentage of fine dust remaining on inner surfaces of filter cloths semiautomatically, by a combination of filter bags and interlocked air passages. Air is returned to room free of visible dust.

15. Tire Spreader

Tire inspection and repairing are facilitated for fleet owners by the pneumatic tire spreader announced by Power-Pak Products Inc., 43 Pearl street, Buffalo 2. Accomodating all types and sizes of tires, it leaves operator with both hands free for work. Operation is by two automatic foot-button controls.

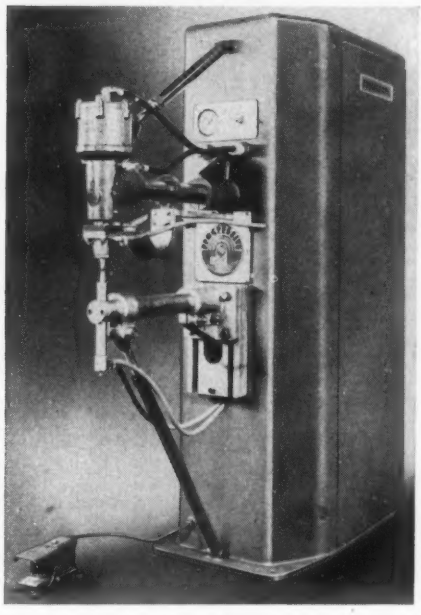
16. Spot Welders

Improved 30, 50 and 75 kva pedestal type spot welding machines, introduced by Progressive Welder Co., 3050 East Outer drive, Detroit 12, are designated as economy type machines, although their construction compares with heavy duty machines. Concentration of rigidity in the front of the machine has made it possible to use light sheet metal construction for the rear of the machine.

Removable sheet metal panels and a full length door provide complete acces-

FOR MORE INFORMATION
on products and equipment described in this section, fill in a card following page 110.

sibility to all units contained in the machine. The right side, being completely clear, may be used for mounting of welding controls. To facilitate miscellaneous spot welding, knees are quick-adjustable, maximum stroke is 2 1/2-in.



and various types of interchangeable electrode holders are available.

Machines have separate water circulation systems for each electrode and the transformer. Pressure regulation is made by gage and control knob at the front in the head of the machine. Air filter and air system lubricator are furnished as standard equipment.

17. Radiation Detector

Battery powered for portability, a new compact Geiger counter radiation detector for laboratory or plant radioactivity determinations is announced by North American Philips Co. Inc., 100 East 42nd street, New York 17. Geiger tube is enclosed in a housing which permits differential detection of hard and soft radiation components and is connected by a flexible cord to the internal circuits.

Controls and indicators are located on a top panel for accessibility. Indicating meter shows rate at which radioactive pulses are received. Visual indication of pulses is provided by a flasher. Head phones may be used to receive audible signals. The detector utilizes five electronic tubes.

18. Tractor Loader

A 4-speed fully reversible transmission which provides practical forward digging speeds plus high reverse maneuvering speeds is incorporated in the design of the model HF ¾-yd Payloader, made by Frank G. Hough Co., Libertyville, Ill. Single lever shifts gears into desired speed range, thereafter the operator controls

direction by merely flipping a directional lever.

Bucket is raised, lowered, dumped and relatched by hydraulic power, controlled by a single lever. It may be dumped completely or gradually at any height. Full bucket capacity is assured and spillage of loose materials prevented by means of an automatic bucket tip-back. Other features are large, easy rolling wheels, hydraulic brakes, automotive type steering and complete visibility in all directions.

19. Flexible Conductor

A new type water-cooled flexible conductor for transmission of high power, high-frequency current is available from Titeflex Inc., 531 Frelinghuysen avenue, Newark 5, N. J. Consisting of a brass, water tight convoluted inner core with an outer braid conductor, the conductor has a flexible insulation extruded over the outer braid.

20. Grain Refiners

Three new grain refiners which add powerful grain refining elements to aluminum alloys in addition to affording cleaning action have been developed by National Smelting Co., 6700 Grant avenue, Cleveland 5. Designated as NS-32, NS-35 and NS-66 refiners, they effectively decrease shrinkage and hot

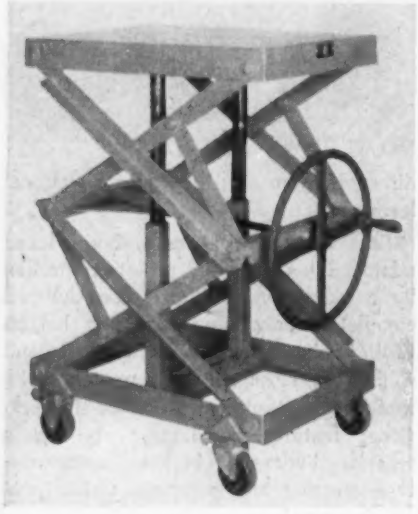
shortness in both sand and permanent mold castings. They also eliminate areas of varying grain size which cause shrinkage porosity.

21. Flowmeter and Control

Serving as flowmeter and industrial control, the Victrometer, made by Victor Equipment Co., 844-54 Folsom street, San Francisco, may be furnished with graduations for argon and commercially pure helium for inert arc gas welding. It has a large black indicating ball which may be read from a considerable distance. Calibrations are visible from front and back. Single wheel controls flow accurately.

22. Elevating Table

Designed to safely carry and lift a load of 1 ton, the industrial elevating table announced by Montgomery & Co. Inc., 53 Park place, New York 7, has minimum and maximum heights from the



floor of 26 and 43 in., respectively. Equipped with two ball bearing swivel and two stationary casters of 4 in. diameter, the table's top measures 20 x 32 in.

Uses include removing dies from storage shelves and placing them in presses, supporting and leveling large overhanging pieces of work on drill presses, transfering heavy work from horizontal mills to drill presses and carrying out many types of heavy handling.

23. Water Demineralizer

Designed to transform ordinary tap water into the chemical equivalent of distilled water, the model U-60 Filt-R-Stil water demineralizer, a development of American Cyanamid Co., 30 Rockefeller Plaza, New York 20, requires no auxiliary equipment and only enough electricity to light a 6 w bulb.

Operating at a 60 gph flow, it delivers water containing a maximum of 10 parts per million of ionized solids or as little as 1 part per million. A built-in controller indicates actual quality of all treated water leaving the unit.

Unit is completely assembled and ready for operation when shipped. It requires connection to raw water line, to drain and electrical outlets only. Until its resins become exhausted, the unit requires no attention.

24. Shop Furnace

Redesigned of fabricated steel, the automatic shop furnace made by Eclipse Fuel Engineering Co., 718 South Main street, Rockford, Ill., has fully enclosed

working parts, protected against dust and dirt. McKee Eclipse centrifugal blower is driven by a direct connected motor.

McKee proportional mixer automatically regulates proportion of gas and air. The control dial is located on the front. Furnace is shipped completely assembled, only connection of gas and electrical lines being necessary to set in operation.

Although primarily designed for intermittent use, it may be operated continuously with satisfactory results under favorable conditions. Design is for hardening punches, dies and small tools in the small tool room. Intended for carbon and intermediate steels, furnace can handle high speed steel satisfactorily.

25. All Position Electrodes

Wilson Welder & Metals Co. Inc., 60 East 42nd street, New York 17, announces an all-position electrode featuring a high nickel core wire and heavy extruded coating. For use on all castings it provides welds that are machinable, free from cracks and porosity with adequate tensile strength and ductility. Electrodes are made in 5/32, 1/8 and 3/32-in. diameters for alternating or direct-current. use.

26. Live Centers

With tips ground on their own axes for true accuracy, Star live centers manufactured by Samuel S. Gelber Co., 542 West Washington boulevard, Chicago 6, are of alloy tool steel hardened to 64 rockwell. Centers have ground thrust type ball bearings and oilite radial bearings. Shaft turns in an antiscoring concentrated lubricant that withstands pressures greater than 50,000 psi. Four styles are made by the concern.

27. Mill Type Switch

Extra-sturdy construction to minimize maintenance in spite of severe service is a feature of the mill type master switch introduced by Square D Co., 4041 North Richards street, Milwaukee 12. Switch

has 48 degrees of travel from first point forward to first point reverse in the master switch handle. The offset handle construction is available for grouping three or four units with only 7 in. handle centers.

Its hardened cam shaft has needle bearings and a hardened star wheel and roller. Return spring pressure is adjustable. Movable contacts are double break, silver, spring closed, mechanically opened and easily removed.

FOR MORE INFORMATION
on the new products and equipment in this section, fill in a card. It will receive prompt attention.

Raw Materials Put Pressure On Steel Price Structure

With scrap, pig iron and coke quoted higher producers are expected to announce new finished steel product schedules by mid-August. Some advances already effected by independent steelmakers. Fourth quarter shipment allotments seen cut

WITH scrap prices soaring to the stratosphere there appeared little chance last week that a general advance in steel prices will be long delayed. Expectations now are new price schedules will be forthcoming from leading producers by mid-August following completion of cost studies now under way, and indications are specific product advances ranging from $2 to $7 per ton will be effected with the average overall boost between $3 and $5.

While it has been expected right along that the United States Steel Corp. subsidiaries would set the price pattern the idea was advanced in some market circles last week that independent producers may not wait for the Steel corporation to act. For that matter, several smaller independents already have advanced prices on specific products which would seem to lend credence to the suggestion. For example, one maker raised prices on galvanized sheets $10 per ton and another $7 per ton. Also one small producer of buttweld pipe is reported to have advanced prices $8 per ton on direct shipment business. While these moves are considered exceptions to industry policy generally, they are seen as hinting the extent to which some products likely may be raised.

Raw materials were in the spotlight last week with scrap prices soaring as much as $5.50 per ton, pig iron rising $3 to $3.50 per ton at northern furnaces following the recent boost of $3.50 on southern iron, and by-product coke going up $1.40 per ton at Chicago.

Situation in scrap is confused with some sales from remote areas reported at $42. For the most part, however, it appeared $38 to $39 was the representative price on steel mill grades at Pittsburgh. Most of the feverish activity in scrap is due to bidding of brokers caught short on mill committments. However, while mill buying is restricted, early resumption of buying by some mills is expected because of limited stocks. When these consumers do begin purchasing it is expected they will have to pay the inflated levels.

Pressure of demand from all consuming directions is unrelieved. In fact, supply conditions in some steel products appear tighter than they were at the beginning of third quarter. Fourth quarter mill shipment quotas in sheets and strip are expected to be set up within the next week, and reports in the trade are to the effect unshipped tonnage carryover in these products will range from four to six weeks. As a result, fourth quarter consumer allotments will be smaller. One large producer is understood to be entirely omitting October quotas on sheets, strip, plates and structurals.

Steelmaking operations continued to rise last week for the third consecutive week as the industry prepared for a high rate of operations over the balance of this year. Last week's advance of 2½ points to 95 per cent of ingot capacity lifted the rate to within two points of the postwar high. With no district reporting curtailment in production, the following advances were recorded: 10 points to 90 per cent at Youngstown, 5 points to 94 per cent at Chicago, 3 points to 90 per cent in New England and 86.5 per cent at Wheeling, 2½ points to 84.5 per cent at St. Louis, and 1 point to 99.5 per cent at Pittsburgh.

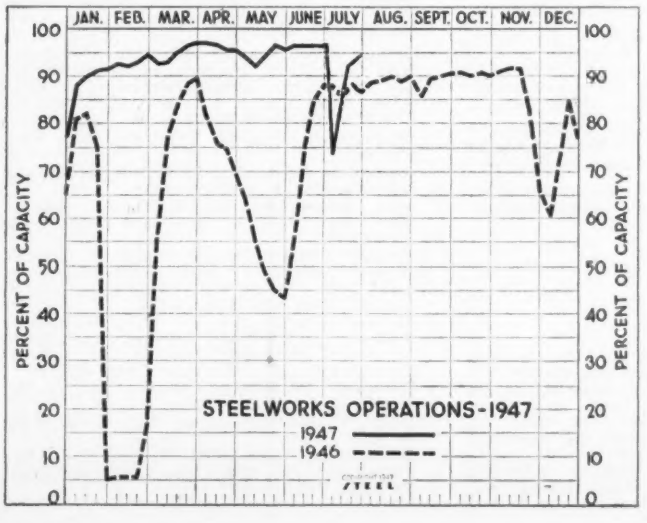
The strong upward pressure on prices which has accompanied the rapid recovery in steel operations since the beginning of July is reflected in advances in STEEL's composite price averages. Last week the steelmaking scrap composite increased to $39.08 from $36.08, while the average on steelmaking pig iron went up from $32.92 to $35.61. The semifinished steel price average held unchanged at $52.10, though business was reported on a negotiated basis above published prices. Withdrawal of premium prices by one seller of nails resulted in a decline in the finished steel composite to $69.14.

DISTRICT STEEL RATES

Percentage of Ingot Capacity Engaged in Leading Districts

	Week Ended July 26	Change	Same Week 1946	Same Week 1945
Pittsburgh	99.5	+ 1	95	87.5
Chicago	94	+ 5	83.5	95
Eastern Pa.	94	None	87	86
Youngstown	90	+10	88	90
Wheeling	86.5	+ 3	93.5	91.5
Cleveland	92	None	92	90.5
Buffalo	88.5	None	88.5	90.5
Birmingham	99	None	99	95
New England	90	+ 3	87	86
Cincinnati	87	None	84	92
St. Louis	84.5	+2.5	54.5	68
Detroit	92	None	83	83
Estimated national rate	95	+2.5	86.5	90.5

Based on weekly steelmaking capacity of 1,749,928 net tons for 1947; 1,762,381 net tons for 1946; 1,831,636 tons for 1945.



COMPOSITE MARKET AVERAGES

	July 26	July 19	July 12	One Month Ago June, 1947	Three Months Ago Apr. 1947	One Year Ago July, 1946	Five Years Ago July, 1942
Finished Steel	$69.14	$69.82	$69.82	$69.82	$69.82	$64.45	$56.73
Semifinished Steel	52.10	52.10	52.10	52.10	52.10	40.60	36.00
Steelmaking Pig Iron	35.61	32.92	32.49	32.49	32.49	27.50	23.00
Steelmaking Scrap	39.08	36.08	35.50	32.48	33.94	19.17	19.17

Finished Steel Composite:—Average of industry-wide prices on sheets, strips, bars, plates, shapes, wire, nails, tin plate, standard and line pipe. Semifinished Steel Composite:—Average of industry-wide prices on billets, slabs, sheet bars, skelp and wire rods. Steelmaking Pig Iron Composite:—Average of basic pig iron prices at Bethlehem, Birmingham, Buffalo, Chicago, Cleveland, Neville Island, Granite City and Youngstown. Steelworks Scrap Composite:—Average of No. 1 heavy melting steel prices at Pittsburgh, Chicago and eastern Pennsylvania. Finished steel, net tons; others, gross tons.

COMPARISON OF PRICES

Representative Market Figures for Current Week; Average for Last Month, Three Months and One Year Ago

Finished material (except tin plate) and wire rods, cents per lb; coke, dollars per net ton; others, dollars per gross ton.

Finished Material

	July 26, 1947	June, 1947	Apr., 1947	July, 1946
Steel bars, Pittsburgh	2.60c	2.60c	2.60c	2.50c
Steel bars, Philadelphia	2.98	2.98	2.98	2.86
Steel bars, Chicago	2.60	2.60	2.60	2.50
Shapes, Pittsburgh	2.50	2.50	2.50	2.35
Shapes, Philadelphia	2.64	2.64	2.64	2.48
Shapes, Chicago	2.50	2.50	2.50	2.35
Plates, Pittsburgh	2.65	2.65	2.65	2.50
Plates, Philadelphia	2.85	2.85	2.85	2.558
Plates, Chicago	2.65	2.65	2.65	2.50
Sheets, hot-rolled, Pittsburgh	2.50	2.50	2.50	2.425
Sheets, cold-rolled, Pittsburgh	3.20	3.20	3.20	3.275
Sheets, No. 10 galv., Pittsburgh	3.55	3.55	3.55	†4.05
Sheets, hot-rolled, Gary	2.50	2.50	2.50	2.425
Sheets, cold-rolled, Gary	3.20	3.20	3.20	3.275
Sheets, No. 10 galv., Gary	3.55	3.55	3.55	†4.05
Strip, hot-rolled, Pittsburgh	2.50	2.50	2.50	2.45
Strip, cold-rolled, Pittsburgh	3.20	3.20	3.20	3.05
Bright basic, bess. wire, Pittsburgh	3.425	3.425	3.425	3.05
Wire nails, Pittsburgh	3.75	4.125	4.125	3.75
Tin plate, per base box, Pittsburgh	$5.75	$5.75	$5.75	*$5.25

* Nominal. † Base, No. 24 gage.

Semifinished Material

Sheet bars, Pittsburgh, Chicago	$50.00	$50.00	$50.00	$38.00
Slabs, Pittsburgh, Chicago	42.00	42.00	42.00	39.00
Rerolling billets, Pittsburgh	42.00	42.00	42.00	39.00
Wire rods $\frac{7}{32}$ to $\frac{1}{4}$-inch, Pitts.	2.55c	2.55c	2.55c	‡2.30c

‡ Base, No. 5 to $\frac{7}{32}$-in.

Pig Iron

	July 26, 1947	June, 1947	Apr., 1947	July, 1946
Bessemer, del. Pittsburgh	$37.83	$34.83	$34.83	$29.77
Basic, Valley	36.00	33.00	33.00	28.00
Basic, eastern del. Philadelphia	38.72	35.52	35.52	27.93
No. 2 fdry., del. Pgh. N. & S. sides	37.33	34.33	34.33	29.27
No. 2 fdry., del. Philadelphia	39.22	36.02	36.02	28.43
No. 2 foundry, Chicago	36.00	33.00	33.00	28.50
Southern No. 2 Birmingham	33.38	29.88	29.28	22.88
Southern No. 2, del. Cincinnati	38.25	34.75	34.75	26.94
Malleable, Valley	36.50	33.50	33.50	28.50
Malleable, Chicago	36.50	33.50	33.50	28.50
Charcoal, low phos., fob Lyles, Tenn.	43.00	40 50	40.50	33.00
Gray forge, del. McKees Rocks, Pa.	33.66	33.66	33.66	28.61
Ferromanganese, fob cars, Pittsburgh	140.25	140.25	140.25	140.00

Scrap

Heavy melt. steel, No. 1, Pittsburgh	$38.50	$32.44	$35.81	$20.00
Heavy melt. steel, No. 2, E. Pa.	39.50	33.38	33.25	18.75
Heavy melt. steel, Chicago	39.25	30.75	32.75	18.75
Rails for rerolling, Chicago	46.75	38.75	38.25	22.25
No. 1 cast, Chicago	43.50	39.50	42.50	20.00

Coke

Connellsville, beehive furnace	$12.00	$9.56	$9.06	$8.75
Connellsville, beehive foundry	14.50	10.75	10.375	9 50
Chicago, oven foundry, del.	18.50	16.10	16.10	15.10

FINISHED AND SEMIFINISHED IRON, STEEL PRODUCTS

Finished steel quoted in cents per pound and semifinished in dollars per gross ton, except as otherwise noted. Delivered prices do not include the 3 per cent federal tax on freight.

Semifinished Steel

Carbon Steel Ingots: Rerolling quality, standard analysis, price negotiated, fob mill. Forging quality, $40, Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Buffalo, Youngstown. **Alloy Steel Ingots:** Pittsburgh, Canton, $52.

Rerolling Billets, Blooms, Slabs: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, Sparrows Point, Birmingham, Youngstown, $42, sales by smaller interests on negotiated basis. Detroit, del., $45; eastern Mich., $46.

Forging Quality Blooms, Slabs, Billets: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, Birmingham, Youngstown, $50; Detroit, del., $53; eastern Mich, $54.

Alloy Billets, Slabs, Blooms: Pittsburgh, Chicago, Buffalo, Bethlehem, Canton, Massillon, $61, del. Detroit $64; eastern Mich., $65.

Sheet Bars: Pittsburgh, Chicago, Cleveland, Buffalo, Canton, Sparrows Point, Youngstown, $53; sales by smaller interests on negotiated basis.

Skelp: Pittsburgh, Sparrows Point, Youngstown, Coatesville, 2.35c per lb.

Wire Rods: Pittsburgh, Chicago, Cleveland, Birmingham, $\frac{7}{32}$ to $\frac{1}{4}$-in., inclusive $2.55-2.80 per 100 lb. Galveston base, $2.65. Worcester, add $0.10. San Francisco (base del.), $3.27.

Bars

Hot-Rolled Carbon Bars and Bar-Size Shapes under 3-in.: Pittsburgh, Youngstown, Chicago, Gary, Cleveland, Buffalo, Birmingham, Duluth, base, 20 tons one size, 2.60c; Detroit, del., 2.75c; eastern Mich., 2.80c; New York, del., 3.01c; Phila., del., 2.98c; San Francisco (base, del.), 3.33-3.65c; Los Angeles (base, del.), 3.325-3.56c; Seattle, 3.285c, base.

Rail Steel Bars: 2.60c-3.45c, same basing points as merchant carbon bars, except base is 10 tons.

Hot-Rolled Alloy Bars: Pittsburgh, Youngstown, Chicago, Canton, Massillon, Buffalo, Bethlehem, base 20 tons one size, 3.05c; Detroit, del., 3.20c; eastern Mich., 3.25c (Texas Steel Co. uses Chicago base price as maximum fob Fort Worth, Tex., price on sales outside Texas, Oklahoma.)

Cold-Finished Carbon Bars: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, base 20,000-39,999 lb., 3.20c; Detroit. 3.35c; Toledo, 3.40c.

Cold-Finished Alloy Bars: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, Canton, base, 3.80c; Detroit, del., 3.95c; eastern Mich., 4.00c.

Reinforcing Bars (New Billet): Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Sparrows Point, Buffalo, Youngstown, base, 2.45c; San Francisco (base, del.), 3.03c; Los Angeles (base, del.), 3.025c; Seattle, 2.985c, base.

Reinforcing Bars (Rail Steel): Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Youngstown, Buffalo, base, 2.60c-3.30c.

Iron Bars: Single refined, Pittsburgh 6.15c-†6.70c; double refined, 7.00-†8.50c; Pittsburgh, staybolt, 7.85c-†10.00c

† Hand puddled

Sheets

Hot-Rolled Sheets: Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Buffalo, Youngstown, Sparrows Point, Middletown, base, 2.50c; Detroit, del., 2.65c; eastern Mich., del., 2.70c; Philadelphia, del., 2.70c; New York, del., 2.79c; Los Angeles (base, del.), 3.24c; San Francisco, (base, del.), 3.245c. (Andrews Steel Co. quotes Middletown, O., base for shipment to Detroit; Alan Wood Steel Co., Conshohocken, Pa., quotes 3.10c, Sparrows Point, Md., base; Granite City Steel Co., 2.875c, fob Granite City, Ill., 2.775c, fob Gary or Birmingham.)

Cold-Rolled Sheets: Pittsburgh, Chicago, Cleveland, Gary, Buffalo, Youngstown, Middletown, base, 3.20c; Granite City, base, 3.30c; Detroit, del., 3.35c; eastern Mich., del., 3.40c; New York, del., 3.61c; Philadelphia, del., 3.58c.

Galvanized Sheets, No. 10: (Based on 5 cent zinc) Pittsburgh, Chicago, Gary, Birmingham, Youngstown, Sparrows Point, Canton, Middletown, base 3.55c; New York, del., 3.84c; Philadelphia, del., 3.75c; Los Angeles (base, del.), 4.32c; San Francisco (base, del.), 4.325c.

Corrugated Galvanized Sheets, No. 10: (Based on 5 cent zinc) Pittsburgh, Chicago, Gary, Birmingham base, 3.65c.

Culvert Sheets, No. 16 flat: (Based on 5 cent zinc), corrugated 10 cents extra; Pittsburgh, Chicago, Gary, Birmingham: Copper alloy, 4.15c; copper-iron or pure iron, 4.50c. Granite City base prices 10 points higher. Los Angeles (base, del.), 4.94c; San Francisco (base, del.), 4.945c.

Aluminized Sheets, No. 20: Hot-dipped, coils or cut to lengths: Pittsburgh, 9.00c.

Long Ternes, No. 10: Pittsburgh, Chicago, Gary, base, 3.55c. (Empire Steel Corp., 4.00c, Pittsburgh.)

Enameling Sheets, No. 12: Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Middletown, base, 3.55c; Granite City, base, 3.65c; Detroit, del., 3.70c; eastern Mich., 3.75c.

Electrical Sheets, No. 24: Field: Pittsburgh, Chicago, Gary, 4.20c; Kokomo, Ind., 4.30c. Armature: Pittsburgh, Chicago, Gary, 4.50c; Granite City, Ill., Kokomo, Ind., 4.60c. Electrical: Pittsburgh, Chicago, Gary, 5.00c; Granite City, Kokomo, 5.10c. Motor: Pittsburgh, Chicago, Gary, 5.75c; Granite City, 5.85c. Dynamo: Pittsburgh, 6.45c; Granite City, 6.55c. Transformer 72. 6.95c; 65, 7.65c; 58, 8.35c; 52, 9.15c, Pittsburgh.

Strip

Hot-Rolled Strip: Pittsburgh, Chicago, Gary, Birmingham, Youngstown, base, 2.50c; Detroit, del., 2.65c; eastern Mich., del., 2.70c.

Cold-Rolled Strip, 0.25 carbon and less: Pittsburgh, Cleveland, Youngstown, 3.20c; Chicago, base, 3.30c; Detroit, del. 3.35c; eastern Mich., 3.40c; Worcester, base, 3.40c.

Cold-Finished Spring Steel: Pittsburgh, Cleveland base: 0.26-0.40 carbon, 3.20c; over 0.40 to 0.60 carbon, 4.70c; over 0.60 to 0.80, 5.30c; over 0.80 to 1.00, 6.80c; over 1.00, 9.10c; add 0.20c for Worcester.

Tin, Terne, Plate

Tin Plate: Pittsburgh, Chicago, Gary, Warren, O., 100-lb base box, $5.75; Granite City, Birmingham, Sparrows Point, $5.85.

Electrolytic Tin Plate: Pittsburgh, Gary, Warren, O., 100-lb base box 0.25 lb tin, $4.85; 0.50 lb tin, $5.05; 0.75 lb tin, $5.25; Granite City, Birmingham, Sparrows Point, $4.95, $5.15, $5.35, respectively.

Tin Mill Black Plate: Pittsburgh, Chicago, Gary, Warren, O., base 29-gage and lighter, 3.60c; Granite City, Birmingham, Sparrows Point, 3.70c.

Manufacturing Ternes (Special Coated): Pittsburgh, Chicago, Gary, 100-lb base box $4.90; Granite City, Birmingham, Sparrows Point, $5.00.

Roofing Ternes: Pittsburgh base per package 112 sheets; 20 x 28 in., coating I.C. 8-lb $13.50; 15-16 $15.50.

Plates

Carbon Steel Plates: Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Youngstown, Sparrows Point, 2.65c; Coatesville, Claymont, Geneva, Utah, 2.80c; New York, del. 2.94c; Phila., del., 2.85c; St. Louis, del., 2.47c; Boston, del., 2.86c; San Francisco and Los Angeles, del., 3.29c-3.46c.
(Central Iron & Steel Co., Harrisburg, Pa., 3.85c, basing points; Alan Wood Steel Co., Conshohocken, Pa., 2.80c, Coatesville and Claymont, equivalent; Worth Steel Co., Claymont, Del., 2.90c mills.)

Floor Plates: Pittsburgh, Chicago, 3.90c.

Open-Hearth Alloy Plates: Pittsburgh, Chicago, 3.787c; Coatesville, 4.15c.

Clad Steel Plates: Coatesville, 10% cladding: Nickel clad, 21.50c; inconel-clad, 30.00c; monel-clad, 29.00c.

Shapes

Structural Shapes: Pittsburgh, Chicago, Gary, Birmingham, Buffalo, Bethlehem, 2.50c; New York, del., 2.70c; Phila., del., 2.64c; Geneva, Utah (base, del), 2.675c; Los Angeles (base, del.), 3.17c-3.41c; Los Angeles and San Francisco (sizes produced at Geneva only), del., 3.14c; Kaiser, del., San Francisco, 3.41c.
(Phoenix Iron Co., Phoenixville, Pa., nominally, 4.00c, fob Phoenixville.)

Steel Piling: Pittsburgh, Chicago, Buffalo, $3 per 100 lb.

Wire and Wire Products

(Fob Pittsburgh, Chicago, Cleveland and Birmingham per 100 pounds).

Wire to Manufacturers in carloads
Bright, basic or bessemer ..... *$3.30–$3.55
Spring (except Birmingham) **$4.25

Wire Products to Trade

Nails and Staples
Standard and cement-coated ..... †$3.75
Galvanized ..... ‡$3.75

Wire, Merchant Quality
Annealed (6 to 8 base) ..... §$3.95
Galvanized (6 to 8 base) ..... §$4.40
(Fob Pittsburgh, Chicago, Birmingham, per base column)

Woven fence, 15 gage and heavier .... ††84
Barbed wire, 80-rod spool ..... ††94
Barbless wire, twisted 94
Fence posts (no clamps) ..... ††90
Bale ties, single loop ..... ††86

* Worcester, $3.40, Duluth, $3.35, base. San Francisco (base, del.) $4.31 for bright basic only.

** Worcester $4.35, Duluth and Trenton, N. J., $4.50, base. San Francisco (base, del.) $5.63 for MB spring wire; $5.28 black premier.

† Worcester $4.05, Cleveland $3.85, base. San Francisco (base, del.) $4.83.

‡ Duluth $3.75, Cleveland $3.85, base. San Francisco (base, del.) $4.83.

§ Worcester $4.05, annealed; $4.50, galvanized. Duluth $3.95, annealed; $4.40, galvanized base. San Francisco (base, del.) $4.96, annealed; $5.41, galvanized.

†† San Francisco (base, del.): Woven fence, 107; barbed wire, 114; bale ties, 110. Duluth (base): Woven fence, 84; barbed wire, 94; fence posts, 90.

Rails, Supplies

Rails: Standard, over 60-lb fob mill, $2.50 per 100 lb. Light rails (billet), Pittsburgh, Birmingham, $2.85 per 100 lb; light rails (rail steel), Williamsport, Pa., $3.45, Pittsburgh, $2.85.
Relaying, 60 lb and over fob warehouse $49-$51 per net ton.

Supplies: Track bolts, 6.50c; heat treated, 6.75c. Tie plates, $2.80 per 100 lb, fob mill; $3.15 base, Seattle. Splice bars, $3 per 100 lb. Standard spikes, 3.65c-4.50c; screw spikes, 5.30-6.40c.

Tubular Goods

Standard Pipe: Base price in carlots, threaded and coupled, to consumers about $200 a net ton. Base discounts Pittsburgh on all types; Lorain on steel butt weld, and seamless; Gary, Ind., 2 points less on steel lap weld and 1 point less on steel butt weld on sizes produced in that district.

Butt Weld

Steel			Iron		
In.	Blk.	Gal.	In.	Blk.	Gal.
⅛	48	23	½	— 2	+20
¼ & ⅜	51	30½	¾	—11½	+10
½	55½	41	1-1¼	—17	+ 2
¾	58½	45	1½	—22½	— 1½
1-3	60½	47½	2	—23	— 2

Lap Weld

Steel			Iron		
In.	Blk.	Gal.	In.	Blk.	Gal.
2	53	39½	1¼	— 1	+20
2½-3	56	42½	1½	— 7	+13
3½-6	58	44½	2	—14½	+ 5½
*8	58	42½	2½-3½	—17	+ 1½
*10	57½	42	4	—21	— 4
*12	56½	41	4½-8	—19	—2½
			9-12	—10	+ 7

* Not T. & C.

Seamless
Steel

In.	Blk.	Gal.	In.	Blk.	Gal.
2	52	38½	*8	57	42
2½-3	55	41½	*10	56½	42
3½-6	57	43½	*12	55½	41

* Not T. & C.

Line Pipe: Base price in carlots to consumers about $200 a net ton. Base discounts Pittsburgh and Lorain, O.

In.	Seamless	In.	Butt Weld
2	51	⅛	47
2½ & 3	54	¼ & ⅜	50
3½ to 8	56	½	54½
10	55½	¾	57½
12	54½	1 to 3	59½

Boiler Tubes: Net base prices per 100 feet fob Pittsburgh, in carload lots, minimum wall, cut lengths 4 to 24 feet, inclusive.

		——Seamless——		—Elec. Weld—	
O.D. Sizes	B.W.G.	Hot Rolled	Cold Drawn	Hot Rolled	Cold Drawn
1″	13	....	$10.89	$10.62	$10.62
1¼″	13	....	12.90	10.59	12.58
1½″	13	$12.00	14.26	11.70	13.90
1¾″	13	13.65	16.23	13.31	15.82
2″	13	15.29	18.17	15.00	17.95
2¼″	13	17.05	20.26	16.71	20.00
2¼″	12	18.78	22.31	18.38	22.00
2½″	12	20.57	24.43	20.11	24.07
2¾″	12	21.80	25.89	21.27	25.46
3″	12	22.87	27.18	22.26	26.68
3¼″	11	26.88	31.94	26.15	31.33
3½″	11	28.86	34.30	28.06	33.64
4″	10	35.82	42.55	34.78	41.68
4½″	9	47.48	56.42	....	....
5″	9	54.96	65.30	....	....
6″	7	84.38	100.25	....	....

Pipe, Cast Iron: Class B, 6-in. and over $65 per net ton, Birmingham; $70, Burlington, N. J.; $75.56, del., Chicago; 4-in. pipe, $5 higher, Class A pipe, $3 a ton over class B.

Bolts, Nuts

Fob Pittsburgh, Cleveland, Birmingham, Chicago; add 15c per cwt, Lebanon, Pa. Additional discounts: 5 for carloads; 15 for full containers, except tire, step and plow bolts.

Carriage and Machine Bolts

½-in. and smaller; up to 6 in. in length ..... 48 off
⅝ and ⅝ x 6-in. and shorter ..... 50 off
Larger diameter; longer than 6 in. ..... 47 off

Tire bolts ..... 38 off
Step bolts ..... 46 off
Plow bolts ..... 57 off
Lag bolts
¼ in. up to 1 in., 6 in. and shorter .. 50 off
¼ in. up to 1 in., longer than 6 in. .. 48 off

Stove Bolts

In packages, nuts separate, 65-10 off; bulk 75 off on 15,000 of 3-in. and shorter, or 5000 over 3-in., nuts separate.

Nuts

Semifinished hexagon	A.S. Light	A.S. Reg. and Heavy
⅞-in. and smaller	51 off	....
½-in. and smaller	....	50 off
½-in.-1-in.	48 off	....
⅝-in.-1-in.	....	49 off
1⅛-in.-1½-in.	46 off	47 off
1⅝-in. and larger	....	40 off

Additional discount of 15 for full containers.

Hexagon Cap Screws

Upset 1-in. smaller (10-20 bright) ..... 56 off
Upset (10-35 heat treated)
⅝ x 6 ..... 51 off
¾, ⅞, & 1 x 6 ..... 47 off

Square Head Set Screws

Upset 1-in. and smaller ..... 61 off
Headless, ¼-in. and larger ..... 46 off
No. 10 and smaller ..... 56 off

Rivets

Fob Pittsburgh, Cleveland, Chicago Birmingham

Structural 5.25c
Lebanon, Pa. 5.40c
⅞-in. and under ..... 55-5 off
Lebanon, Pa. ..... 55-5 off plus 15c per cwt.

Washers, Wrought

Fob Pittsburgh, Chicago, Philadelphia, to jobbers and large nut and bolt manufacturers, lcl ..... $1.50-$2.00 off

Tool Steels

Tool Steel: Pittsburgh, Bethlehem, Syracuse, Canton, O., Dunkirk, N. Y., base, cents per bbl; reg. carbon 16.00c; extra carbon 20.00c; special carbon 24.00c; oil-hardening 26.00c; high carbon-chromium 47.00c.

W	Cr	V	Mo	Base, per lb
18.00	4	1	...	74.00c
1.5	4	1	8.5	59.00c
12	3	0.50	...	62.00c
6.40	4.15	1.90	5	63.00c
5.50	4.50	4	4.50	80.00c

Stainless Steels

Base, Cents per lb

Grade	Bars, Drawn Wire, Structurals	Plate	Sheets	Hot Rolled Strip	Cold Rolled Strip
CHROMIUM NICKEL STEELS					
301	26.00c	29.50c	37.00c	22.00c	28.00c
302	26.00	29.50	37.00	23.50	30.50
303	28.50	31.50	39.00	29.50	36.00
304	27.50	31.50	39.00	25.50	32.50
308	31.50	37.00	44.50	31.00	38.00
309	39.00	43.50	51.00	40.50	51.00
310	53.50	56.50	57.50	53.00	61.00
316	43.50	48.00	52.00	43.50	52.00
321	31.50	37.00	44.50	32.00	41.50
347	36.00	41.50	49.00	36.00	45.50
431	21.00	24.00	31.50	19.00	24.50
440A	26.00	31.00	36.50	26.00	30.50
STRAIGHT CHROMIUM STEEL					
403	23.50	27.00	32.00	23.00	29.50
410	20.50	23.50	29.00	18.50	24.00
416	21.00	24.00	29.50	20.00	25.50
420	26.00	31.00	36.50	26.00	39.50
430	21.00	24.00	31.50	19.00	24.50
430F	21.50	24.50	32.00	20.50	27.00
442	24.50	28.00	35.50	26.00	35.00
443	24.50	28.00	35.50	26.00	35.00
446	30.00	33.00	39.50	38.00	56.50
*501	9.00	13.00	17.50	13.00	18.50
*502	10.00	14.50	18.50	14.50	19.50
†STAINLESS CLAD STEEL (20%)					
304	....	24.00	22.00	....	....
410	....	22.00	20.00	....	....
430	....	22.50	20.50	....	....
446	....	29.00	27.00	....	....

* Low chromium. † Fob Pittsburgh and Washington, Pa.; plate prices include annealing and pickling.

RAW MATERIAL AND FUEL PRICES

Minimum delivered prices do not include 3 per cent federal tax

PIG IRON

Prices per gross ton	No. 2 Foundry	Basic	Bessemer	Malleable
Bethlehem, Pa., base	$37.50	$37.00	$38.50	$38.00
Newark, N. J., del.	39.34	38.84	40.34	39.84
Brooklyn, N. Y., del.	40.50	...	...	41.00
Philadelphia, del.	39.22	38.72	40.22	39.72
Birdsboro, Pa., base	40.50	40.00	41.50	41.00
Birmingham, base	33.38	32.88	....	....
Baltimore, del.	39.78	....	....	....
Chicago, del.	37.12	....	....	....
Cincinnati, del.	38.25	....	37.75	....
Newark, N. J., del.	39.46	....	....	....
Philadelphia, del.	38.84	....	....	....
St. Louis, del.	37.37	....	36.87	....
Buffalo, base	36.00	35.50	37.00	36.50
Boston, del.	42.48	41.98	43.48	42.98
Rochester, del.	37.84	37.34	38.84	38.34
Syracuse, del.	38.50	38.00	39.50	39.00
Canton, Massillon, O., base	36.00	35.50	....	36.50
Chicago, base	36.00	35.50	37.00	36.50
Milwaukee, del.	37.32	36.82	38.32	37.83
Muskegon, Mich., del.	39.83	....	....	40.33
Cleveland, fob furnace	36.00	35.50	37.00	36.50
Akron, del.	37.67	37.17	38.67	38.17
Duluth, base	36.50	36.00	37.50	37.00
Erie, Pa., base	36.00	35.50	37.00	36.50
Everett, Mass., base	45.00	....	....	45.50
Granite City, Ill., base	37.00	36.50	....	37.00
St. Louis, del.	37.75	37.25	....	37.75
†**Neville Island, Pa.,** base	36.50	36.00	37.00	36.50
Pittsburgh, del., N. & S. Sides	37.33	36.83	37.83	37.33
Provo, Utah, base	36.50	36.00	....	....
Seattle, Tacoma, Wash., del.	41.60	....	....	....
Portland, Oreg., del.	41.60	....	....	....
Sharpsville, Pa., base	36.50	36.00	37.00	36.50
Steelton, Pa., base	37.50	37.00	38.50	38.00
Struthers, O., base	37.00	36.50	37.50	37.00
Swedeland, Pa., base	39.00	38.50	40.00	39.50
Philadelphia, del.	40.04	39.54	41.04	40.54
Troy, N. Y., base	38.00	37.50	39.00	38.50
Toledo, O., base	36.00	35.50	37.00	36.50
Cincinnati, del.	39.50	39.00	....	....
Youngstown, O., base	36.50	36.00	37.00	36.50
Mansfield, O., del.	39.48	38.98	39.98	39.48

† To Neville Island base add: 66c for McKees Rocks, Pa., $1.01 Lawrenceville, Homestead, McKeesport, Ambridge, Monaco, Aliquippa; 97c (water), Monongahela; $1.33, Oakmont, Verona; $1.49 Brackenridge.

Blast Furnace Silvery Pig Iron

6.00-6.50 per cent (base)	$42.50		
6.51-7.00	$43.50	9.01- 9.50	48.50
7.01-7.50	44.50	9.51-10.00	49.50
7.51-8.00	45.50	10.01-10.50	50.50
8.01-8.50	46.50	10.51-11.00	51.50
8.51-9.00	47.50	11.01-11.50	52.50

Fob Jackson, O., per gross ton; Buffalo base $4.25 higher. Buyer may use whichever base is more favorable.

Bessemer Ferrosilicon

Prices same as for high silicon silvery iron, plus $1 per gross ton.

Electric Furnace Silvery Pig Iron: Si 14.01-14.50%, $61.75, Jackson, O.; $65, Niagara Falls; $66, piglets, $64, open-hearth and foundry grade, Keokuk, Iowa. Add $1 a ton for each additional 0.5% Si to 18%; 50c for each 0.5% Mn over 1%; $1 a ton for 0.045% max. phos.

Charcoal Pig Iron

Semi-cold blast, low phosphorus, Fob furnace, Lyles, Tenn. ...$43.00 (For higher silicon irons a differential over and above the price of base grade is charged as well as for the hard chilling iron, Nos. 5 and 6.)

Gray Forge

Neville Island, Pa. $36.00

Low Phosphorus

Steelton, Pa., Buffalo, Troy, N. Y., $42.00; Birdsboro, Pa., $45 base; Philadelphia, $44.22, del. Intermediate phosphorus, Central furnace, Cleveland, $39.00.

Differentials

Basing point prices are subject to following differentials:

Silicon: An additional charge of 50 cents a ton for each 0.25 per cent silicon in excess of base grade (1.75% to 2.25%).

Phosphorus: A reduction of 38 cents a ton for phosphorus content of 0.70 per cent and over.

Manganese: An additional charge of 50 cents a ton for each 0.50 per cent, or portion thereof, manganese in excess of 1%.

Nickel: An adidtional charge for nickel content as follows: Under 0.50%, no extra; 0.50% to 0.74%, inclusive, $2 a ton; for each additional 0.25% nickel, $1 a ton.

Metallurgical Coke

Price Per Net Ton

Beehive Ovens

Connellsville, furnace	$11.50-$12.50
Connellsville, foundry	14.00- 15.00
New River, foundry	12.50
Wise county, foundry	11.15
Wise county, furnace	10.65

* Operators of hand-drawn ovens using trucked coal, $10.10-$11.10.

Oven Foundry Coke

Kearney, N. J., ovens	$15.35
Chicago, outside del.	17.50
Chicago, del	18.50
Terre Haute, del.	15.60
Milwaukee, ovens	18.25
New England, del.	17.25
Birmingham, del.	15.00
Indianapolis, ovens	14.50
Cincinnati, del.	16.50
Ironton, O., ovens	14.50
Painesville, ovens	14.60
Cleveland, del.	15.90
Buffalo, del.	16.10
Detroit, del.	15.75
Philadelphia, ovens	15.50
Swedeland, Pa., ovens	15.50
Portsmouth, O., ovens	14.00
Fairmont, W. Va., ovens	13.75
Pittsburgh, del.	15.61

Coal Chemicals

Spot, gal. freight allowed east of Omaha. Effective as of Apr. 1, 1947.

Pure and 90% benzol	19.00c
Toluol, two degrees	23.00c
Industrial xylol	23.00c
Solvent naphtha	26.00c

Per pound fob works

Phenol (car lots, returnable drums)	11.25c
Do., less than carlots	12.00c
Do., tank cars	10.25c

Eastern plants, per pound

Naphthalene flakes, balls, bbl, to jobbers, "house-hold use"	9.50c

Per ton, bulk, fob plants

Sulphate of ammonia	$30.00

Refractories

Per 1000, fob shipping point Net Prices

Fire Clay Brick

Super Duty

Pa., Mo., Ky.	$87.00

High Heat Duty

Pa., Ill., Md., Mo., Ky.	70.00
Ala., Ga.	70.00
N. J.	75.00

Intermediate Heat Duty

Ohio	64.00
Pa., Ill., Md., Mo., Ky.	64.00
Ala., Ga.	56.00
N. J.	67.00

Low Heat Duty

Pa., Md., Ohio	56.00

Ladle Brick

(Pa., O., Va., Mo.)

Dry Press	47.00
Wire Cut	45.00

Malleable Bung Brick

All bases	80.00

Silica Brick

Pennsylvania	70.00
Joliet, E. Chicago	79.00
Birmingham, Ala.	70.00

Magnesite

Domestic dead-burned grains, net ton, fob Chewelah, Wash.	
Bulk	24.00
Single bags	28.00

Basic Brick

Net tons, fob Baltimore, Plymouth Meeting, Chester, Pa.

Chrome brick	59.00
Chem. bonded chrome	59.00
Magnesite brick	81.00
Chem. bonded magnesite	70.00

Ores

Lake Superior Iron Ore

Gross ton, 51½% (Natural) Lower Lake Ports

Old range bessemer	$5.95
Old range nonbessemer	5.80
Mesabi bessemer	5.70
Mesabi nonbessemer	5.55
High phosphorus	5.55

Eastern Local Ore

Cents, units, del. E. Pa.

Foundry and basic 56-63% contract	15.25

Foreign Ore

Cents per unit, cif Atlantic ports

No. African low phos.	Nom.
Swedish basic, 60 to 68%	13.50
Spanish, No. African basic, 50 to 60%	Nom.
Brazil iron ore, 68-69% fob Rio de Janeiro, nom.	5.50–6.50

Tungsten Ore

Wolframite and scheelite per short ton unit, duty paid	$32–$34

Manganese Ore

46-50%, duty paid, fob cars, New York, Philadelphia, Baltimore, Norfolk, Va., Mobile, Ala., New Orleans, 63.00c-67.00c.

Chrome Ore

Gross ton fob cars, New York, Philadelphia, Baltimore, Charleston, S. C., Portland, Oreg., or Tacoma, Wash.

(S S paying for discharge; dry basis, subject to penalties if guarantees are not met.)

Indian and African	
48% 2.8:1	$37.50
48% 3:1	39.00
48% no ratio	31.00
South African (Transvaal)	
44% no ratio	$27-$27.50
45% no ratio	28.00
48% no ratio	30.00
50% no ratio	31.00
Brazilian—nominal	
44% 2.5:1 lump	$33.65
48% 3:1 lump	43.50
Rhodesian	
45% no ratio	$27-$27.50
48% no ratio	30.00
48% 3:1 lump	39.00
Domestic (seller's nearest rail)	
48% 3:1	$39.00

Molybdenum

Sulphide conc., lb., Mo. cont., mines	$0.75

Fluorspar

Metallurgical grade, fob shipping point in Ill., Ky., net tons, carloads, effective CaF_2 content, 70% or more, $33; 65% to 70%, $32; 60% to 65%, $31; less than 60%, $30.

HIGH-STRENGTH—LOW ALLOY STEELS

Prices in dollars per 100 pounds

	Pittsburgh	Chicago	Gary	Youngstown	Sparrows Point	Buffalo	Bethlehem	Canton	Massillon
Sheets, Hot-Rolled	3.85	3.85	3.85	3.85	3.85	3.85	...	...	...
Cold-Rolled	4.75	4.75	4.75	4.75	...	4.75	...	...	...
Galvanized	5.40	...	...	...	...	...	...	...	...
Strip, Hot-Rolled	3.85	3.85	3.85	3.85	...	...	...	...	...
Cold-Rolled	4.55	4.65	4.65	4.65	...	...	...	...	...
Shapes Structural	3.85	3.85	...	3.85	...	...	3.85	...	...
Plates	4.10	4.10	4.10	...	4.10	...	...	...	...
Bars and Bar Shapes	4.00	4.00	4.00	4.00	...	4.00	...	4.00	4.00

WAREHOUSE STEEL PRICES

Prices, cents per pound, for delivery within switching limits, subject to extras

	SHEETS					STRIP		BARS				PLATES	
	H-R 10G	C-R 10G	C-R 17G	Gal. *10G	Gal. *24G	†H-R	†C-R	H-R Rds. ⅜" to 3"	C-F Rds. ½"& up	H-R Alloy ($4140)	Structural Shapes	Carbon ⅜"-¾"	Floor ¾" & Thicker
Boston (City)	4.50	5.67[4]	5.22[4]	5.55[4]	6.80[4]	4.65	6.36	4.62	5.22	7.12	4.47	4.70	6.42
††New York (city)	4.42	5.72	5.42[5]	5.47[5]	....	4.67	....	4.67	5.17	8.42[12]	4.42	4.82	6.40
New York (country)	4.32	5.57	5.27[5]	5.37[5]	....	4.52	....	4.52	....	....	4.27	4.67	6.25
Philadelphia (city)	4.34	5.73[9]	5.33[9]	5.29[5]	6.54[5]	4.43	5.28	4.48	5.13	6.87	4.22	4.44	5.93
Philadelphia (country)	4.24	5.63[9]	5.23[9]	5.19[5]	6.44[5]	4.33	5.18	4.38	....	6.60	4.12	4.34	5.83
Baltimore (city)	3.99†	5.50[8]†	5.20[8]†	5.14[5]	6.39[5]	4.40	....	4.45	5.10	....	4.34	4.39	5.90
Baltimore (country)	3.89†	5.40[8]†	5.10[8]†	....	....	....	....	....	....	....	4.24	4.29	5.80
Washington (city)	4.35	....	....	5.18[5]	6.43[5]	4.65	....	4.70	5.60[11]	....	4.60	4.65	6.60
Norfolk, Va.	4.35	....	....	....	....	....	....	4.75	5.50	....	4.50	4.50	6.25
Memphis, Tenn. (city)	4.47[20]	....	5.53[20]†	5.97[5]	....	4.72[20]	....	4.67[20]	5.78	....	4.67[20]	4.92[20]	6.58[20]
Memphis, Tenn. (country)	4.37[20]	....	5.43[20]†	5.87[5]	....	4.62[20]	....	4.57[20]	5.68	....	4.57[20]	4.82[20]	6.48[20]
Buffalo (city)	4.15	....	4.85[6]	5.35[5]	....	4.30	5.25	4.10	4.75	....	4.10	4.55	5.90
Buffalo (country)	4.00	....	4.70[6]	4.95[5]	....	3.90	4.85	3.95	4.60	6.60	3.95	4.10	5.45
Pittsburgh (city)	3.95†	....	4.75[8]†	5.10[5]	6.35[5]	4.05	5.00	4.10	4.75	6.60	4.10	4.25	5.60
Pittsburgh (country)	3.80†	....	4.60[8]†	4.95[5]	6.20[5]	3.90	4.85	3.95	4.60	6.60	3.95	4.10	5.45
Youngstown, O. (city)	4.188	5.338	4.888	5.05	6.30	4.00	....	4.238	5.138	....	4.218	4.488	5.178
Youngstown, O. (country)	....	....	....	4.95	6.20	3.90	....	....	....	....	....	....	....
Detroit	4.05	5.30	4.85‡	5.42	6.67	4.34	5.24	4.20	4.87[12]	7.01	4.42	4.49	5.92
Cleveland (city)	4.15	5.15[8]	4.85[8]	5.238[5]	6.488[5]	4.188	5.10	4.10	4.75	6.858	4.311	4.25	5.961
Cleveland (country)	4.00	5.00[8]	4.70[8]	....	....	3.90	4.95	3.95	4.60	....	....	4.10	....
Cincinnati	4.016	4.816[8]	....	5.166[5]	6.416[5]	4.394	....	4.403	5.053	....	4.444	4.553	5.944
Chicago (city)	4.15	5.15[8]	4.85[8]	5.10[5]	6.35[5]	4.05	5.10	4.10	4.75	6.60[12]	4.10	4.30	5.75
Chicago (country)	4.00	5.00[8]	4.70[8]	4.95[5]	6.20[5]	3.90	4.95	3.95	4.60	6.60[12]	3.95	4.15	5.60
Milwaukee	4.299	5.299[8]	4.999[8]	5.249[5]	6.499[5]	4.199	5.249	4.249	4.899	6.899	4.249	4.449	5.899
St. Paul, Minneapolis	4.284[13]	....	5.084[8]†	5.434[5]	6.684[5]	4.384[12]	....	4.434[13]	5.476[11]	7.084[11]	4.434[13]	4.584[13]	6.084[13]
Indianapolis	4.04	....	4.84[8]	5.29[5]	6.54[5]	4.24	....	4.36†‡	5.26	....	4.36	4.61	6.01
St. Louis	4.699	....	4.899[9]†	5.424[5]	6.674[5]	4.199	....	4.249	5.074[12]	7.074	4.249	3.999	5.899
Birmingham (city)	4.15[20]	....	....	5.25[5]	....	4.15[20]	....	4.15[20]	5.58	....	4.10	4.35	6.56
Birmingham (country)	4.00[20]	....	....	5.10[5]	....	4.00[20]	....	3.95[20]	....	....	3.95	4.20	....
New Orleans	4.68[20]**	....	5.94[8]	....	....	4.88[20]	....	4.83[20]**	5.94[11]	....	4.73[20]**	5.03[20]	6.99[20]
Houston, Tex.	6.00[1]	....	....	6.00	....	6.00[1]	....	5.35[1]	....	6.35	5.85	5.85	6.40
Omaha, Nebr.	4.968	....	....	5.918[5]	7.168[5]	4.868	....	4.918	5.568[11]	....	4.918	5.068	6.568
Los Angeles	5.35	....	7.00[8]	....	7.45[5]	5.65	8.35	5.10	6.90[10]	9.35	5.20	5.10	7.20
San Francisco	4.90[21]	....	6.30[5]	....	7.35[5]	5.20[14]	8.35[14]	4.75[14]	***	9.35[16]	4.90[14]	5.00[14]	6.80[14]
Seattle and Tacoma, Wash.	5.00[17]	....	6.75[5]	6.30[5]	....	5.30[17]	....	5.00[17]	7.10[19]	8.50[13]	4.95[17]	5.15[17]	7.25[17]

Base Quantities: 400 to 1999 pounds except as noted: Cold-rolled strip, 2000 lb and over, cold finished bars, 1000 pounds and over; [1]—any quantity; [2]—300 to 1999 pounds; [3]—150 to 2249 pounds; [4]—three to 24 bundles; [5]—450 to 1499 pounds; [6]—one bundle to 1499 pounds; [7]—one to nine bundles; [8]—400 to 1499 pounds; [9]—1000 to 1999 pounds; [10]—450 to 39,999 pounds; [11]—1000 to 39,999 pounds; [12]—1000 pounds and over; [13]—400 to 14,999 pounds; [14]—400 to 39,999; [15]—2000 lb and over; [16]—1000 to 4999; [17]—300 to 9999 pounds; [18]—1500 to 1999 pounds; [19]—1500 to 39,999; [20]—400 to 3999 pounds; [21]—400 lb and over.

* Includes gage and coating extra, except Birmingham (coating extra excluded); † does not include gage extras; ‡ 15 gage; § as rolled, except New York, Jersey City, Indianapolis and San Francisco where price represents annealed bars; ** add 0.46 for sizes not rolled in Birmingham; †† same prices quoted for Jersey City, N. J.; ‡‡ add 15c for 100 lb for slow moving items; §§ 18 gage and heavier; *** rounds under ⅜ in. 7.00c, ⅜ in. and over 6.50c, squares, hexagons and flats 6 in. and narrower 7.50c, flats over 6 in. 8.25c at San Francisco.

PRICES OF LEADING FERROALLOYS PRODUCTS

Spiegeleisen: 19-21% Mn, 1-3% Si, carlot per gross ton, Palmerton, Pa., $44, Pittsburgh, $48. 16% to 19% Mn, Pittsburgh, $47.

Ferromanganese, standard: 78-82% c.l. gross ton, duty paid, $135 fob cars, Baltimore, Philadelphia or New York, whichever is most favorable to buyer, Birmingham, Ala. (where Sloss-Sheffield Steel & Iron Co. is producer); $140 25 fob cars, Pittsburgh, including 75c switching charge, (where Carnegie - Illinois Steel Corp. is producer); add $8 for packed c.l., $10 for ton, $13.50 for less ton; $1.70 for each 1%, or fraction contained manganese over 82% or under 78%.

Ferromanganese, low carbon: Eastern zone: Special, 21c; regular, 20.50c; medium, 14.50c; central zone: Special, 21.30c; regular, 20.80c; medium, 14.80c; western zone: Special, 21.30c; regular, 21.20c; medium, 15.20c. Prices are per pound contained Mn, bulk carlot shipments, fob shipping point, freight allowed. Special low-carbon has content of 90% Mn, 0.10% C, and 0.06% P.

Ferromanganese Briquets: (Weight approx. 3 lb and containing exactly 2 lb Mn). Prices per lb of briquets: Contract, bulk, carlots, 7.00c, packed, carlots, 7.60c, ton lots, 8.00c, smaller lots 8.40c, eastern, freight allowed; 7.25c, 7.85c, 8.60c and 9.00c, central; 7.80c, 8.40c, 10.50c and 10.90c, western; spot up 0.25c; notched, up 0.25c.

Ferrotungsten: Spot, 10,000 lb or more, per lb contained W, $2.27; contract, $2.25; freight allowed as far west as St. Louis.

Ferrotitanium: 40-45%, R.R. freight allowed, per lb contained Ti; ton lots $1.23; smaller lots $1.25; eastern. Spot up 5c per lb.

Ferrotitanium: 20-25%, 0.10 maximum C; per lb contained Ti; ton lots $1.35; smaller lots $1.40 eastern. Spot up 5c per lb.

Ferrotitanium, High - Carbon: 15-20% contract basis, per net ton, fob Niagara Falls, N. Y., freight allowed to destination east of Mississippi river and north of Baltimore and St. Louis, 6.8% C, $142.50; 3-5% C, $157.50.

Ferrovanadium: V 0.35-0.55%, contract basis, per lb contained V, fob producers plant with usual freight allowances; open-hearth grade $2.70; special grade $2.80; highly-special grade $2.90.

Ferromolybdenum: 55-75% per lb, contained Mo, fob Langeloth and Washington, Pa., furnace, any quantity 95.00c.

Ferrophosphorus: 17-19%, based on 18% P content with unitage of $3 for each 1% of P above or below the base; gross tons per carload fob sellers' works, with freight equalized with Rockdale, Tenn.; contract price $58.50, spot $62.25.

Ferrosilicon: Contract, lump, packed; eastern zone quotations: 90-95% c.l. 13.80c, ton lots 14.30c, smaller lots 14.80c; 75%, c.l. 11.05c, ton lots 11.65c, smaller lots 12.25c; 50%, c.l. 9.00c, ton lots 9.65c, smaller lots 10.30c. Deduct 1.00c for bulk, carlots, 80-90% and 90-95%; 1.05c, 75%; 1.20c, 50%. Prices are fob shipping point, freight allowed, per lb of contained Si. Spot prices 0.25c higher on 80-90%, 0.30c on 75%, 0.45c on 50%.

Ferroboron: (B 17.50% max. and C 1.50% max., Al 0.50% max. and C 0.50% max.) Prices per lb of alloy, contract, ton lots $1.20, smaller lots $1.30, eastern, freight allowed; $1.2075 and $1.3075 central; $1.229 and $1.329, western; spot add 5c.

Ferrocolumbium: 50-60%, per lb contained columbium in gross ton lots, contract basis, R. R. freight allowed, eastern zone, $2.50; smaller lots $2.55. Spot up 10c.

Ferrochrome: Contract, lump, packed; **high carbon,** eastern zone, c.l. 16.20c, ton lots 16.80c; central zone, add 0.40c and 1.30c; western zone, add 0.55c and 2.10c. Deduct 0.60c for bulk carlots. **High carbon, high nitrogen,** add 5c to all high carbon ferrochrome prices. Deduct 0.55c for bulk carlots. Spot prices up 0.25c. **Low carbon,** eastern zone, bulk, c.l., max. 0.06% C 23c; 0.1% 22.50c, 0.15% 22.00c, 0.2% 21.75c; 0.5% 21.50c, 1% 21.00c, 2% 20.50c; add 1.35c for 2000 lb to c.l.; central zone, add 0.4c for bulk, c.l.; and 0.65c for 2000 lb to c.l.; western zone, add 0.5c for bulk, c.l., and 1.85c for 2000 lb to c.l.; carlot packed differential 0.80c. Prices are per lb of contained Cr, freight allowed.

Low carbon, high nitrogen: Add 2c to low carbon ferrochrome prices. For higher nitrogen low carbon, add 2c for each 0.25% of nitrogen over 0.75%.

Ferrochrome, Special Foundry: (Cr 62-66%, C above 5-7%.) Contract, 2-inch x D, packed, eastern zone, freight allowed, c.l. 17.05c, ton lots 17.60c, smaller lots 18.30c; central zone, add 0.40c for c.l. and 1.30c for smaller lots; western zone, add 0.55c for c.l. and 2.10c for smaller lots. Deduct 0.60c for bulk carlots. **S. M. Ferrochrome, high carbon:** (Cr 60-65%, Si, Mn and C 4-6% each.) Contract, lump, packed, eastern zone, freight allowed, c.l. 17.30c, ton lots 17.90c, smaller lots 18.60c; central zone, add 0.40c for c.l. and 1.30c for smaller lots; western zone, add 0.55c for c.l. and 2.10c for smaller lots. Prices are per pound of contained chromium, spot prices 0.25c higher. Deduct 0.60c for bulk carlots.

S. M. Ferrochrome, low carbon: (Cr 62-66%, Si 4-6%, Mn 4-6% and C 1.25% max.) Contract, carlot, bulk 21.00c; packed carlot 21.80c, ton lots 22.35c, smaller lots 23.35c, eastern, freight allowed, per pound of contained Cr; 21.40c, 22.20c, 23.00c, and 24.00c, central; 21.50c, 22.30c, 24.20c and 25.20c, western spot up 0.25c.

Ferrochrome Briquets: Containing exactly 2 lb Cr, packed eastern zone, c.l. 10.35c, ton lots 10.75c, smaller lots 11.15c; central zone, add 0.25c for c.l. and 0.90c for smaller lots; western zone, add 0.55c for c.l. and 2.10c for smaller lots. Deduct 0.50c for bulk carlots. Prices per pound of briquets; spot prices 0.25c higher; notched 0.25c higher.

Chromium Metal: 97% min. Cr, max. 0.50% C, eastern zone, per lb contained Cr bulk, c.l. 79.50c, 2000 lb c.l. 80c; central 81c and 82.60c; western 82.25c and 84.75c, fob shipping point, freight allowed.

Chromium-Copper: (Cr 8-11%, Cu 88-90%, Fe 1% max., Si 0.50% max.). Contract, any quantity, 45c, eastern, Niagara Falls, N. Y., basis, freight allowed to destination, except to points taking rate in excess of St. Louis rate to which equivalent of St. Louis rate will be allowed; spot up 2c.

Calcium metal; cast: Contract, ton lot or more, $1.60; 100 to 1999 lb, $1.95; less than 100 lb, $3.15 per lb of metal, eastern zone; $1.615, $1.965 and $3.185, western; spot up 5c.

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18% and Si 53-59%), per lb of alloy. Contract, carlots, packed, 16.10c, ton lots 17.60c, smaller lots 18.60c, eastern, freight

allowed; 16.60c, 18.45c, 19.45c, central; 18.65c, 20.20c, 21.20c, western; spot up 0.25c.

Calcium - Silicon: (Ca 30-35%, Si 60-65% and Fe 3.00% max.), per lb of alloy. Contract, lump, packed, carlots 14.60c, ton lots 16.10c, smaller lots 17.10c, eastern, freight allowed; 15.10c, 16.85c, 17.85c, central; 17.15c, 19.00c, 20.00c, western; spot up 0.25c.

Silicon Metal: Min. 97% Si and max. 1% Fe, eastern zone, bulk, c.l. 14.50c; 2000 lb to c.l. 16.00c; central zone, 15.10c and 18.25c; western, 15.70c and 20.00c; min. 96% Si and max. 2% Fe, eastern, bulk, c.l., 14.10c; 2000 lb to c.l. 15.60c; central, 14.70c and 17.85c; western, 15.30c and 19.60c, fob shipping point, freight allowed. Price per lb contained Si.

Silicomanganese Briquets: Containing exactly 2 lb Mn and about ½ lb Si, eastern zone, bulk, c.l. 6.75c, ton lots 7.75c; central zone, add 0.25c for c.l. and 0.60c for ton lots; western, add 0.80c for c.l. and 2.50c for ton lots. Notched, up 0.25c.

Silicon Briquets: Weighing about 5 lb and containing exactly 2 lb Si, packed, eastern zone, c.l. 4.70c, ton lots 5.10c, smaller lots 5.50c; weighing about 2¼ lb and containing 1 lb Si, packed, eastern zone, c.l. 4.85c, ton lots 5.25c, smaller lots 5.65c; notched 0.25c higher; central zone, add 0.25c for c.l. and 0.60c for smaller lots; western zone, add 0.45c for c.l. and 0.90c for smaller lots. Prices are fob shipping point, freight allowed; spot prices 0.25c higher. Deduct 0.50c for bulk carlots.

Manganese Metal: (Min. 96% Mn., max. 2% Fe), per lb of metal, eastern zone, bulk, c.l. 30c, 2000 lb to c.l., 32.00c; central 31.00c and 33.45c; western, 31.45c and 34.40c.

Electrolytic Manganese: 99.9% plus, fob Knoxville, Tenn., freight allowed east of Mississippi on 250 lb or more: Carlots 32c, ton lots 34c, drum lots 36c, less than drum lot 38c. Add 1½c for hydrogen-removed metal.

Manganese-Boron: (Mn 75% approx., B 15-20%, Fe 5% max., Si 1.50% max. and C 3% max.) Prices per lb of alloy. Contract, ton lots $1.89, less $2.01, eastern, freight allowed; $1.903 and $2.023, central; $1.935 and $2.055, western; spot up 5c.

Nickel-Boron: (B 15-18%, Al 1% max., Si 1.50% max., C 0.50% max., Fe 3% max., Ni, balance). Prices per lb of alloy: Contract, 5 tons or more $1.90, 1 ton to 5 tons $2.00, smaller lots $2.10, eastern, freight allowed; $1.9125, $2.0125 and $2.1125, central; $1.9445, $2.0445 and $2.1445, western; spot same as contract.

Borosil: 3 to 4% B, 40 to 45% Si; $6.25 per lb contained B, fob Philo, O., freight not exceeding St. Louis rate allowed.

Bortam: B 1.5-1.9%, ton lots, 45c per lb; smaller lots, 50c per lb.

Carbortam: B 0.90 to 1.15% net ton to carload, 8c per lb, fob Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

Silicaz Alloy: (Si 35-40%, Ca 9-11%, Al 5-7%, Zr 5-7%, Ti 9-11% and B 0.55-0.75%) Prices per lb of alloy, contract, or spot carlots 35.00c, ton lots 37.00c, smaller lots 39.00c, eastern, freight allowed; 35.30c, 38.10c and 40.10c, central; 35.30c, 40.05c and 42.05c, western; spot up 0.25c.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7% and Fe approx. 20%) Price per lb of alloy, contract, carlots 13.50c, ton lots 14.25c, smaller lots 15.00c, eastern zone, freight allowed; 13.80c, 15.35c, 16.10c, central; 13.80c, 17.30c, 18.05c, western; spot up 0.25c.

CMSZ Alloys 4 & 5: (Alloy 4—Cr 45-49%, Mn 4-6%, Si 18-21%, Zr 1.25-1.75%, C 3.00-4.50%; alloy 5—Cr 50-56%, Mn 4-6%, Si 13.50-16.00%, Zr 0.75-1.25%, C 3.50-5.00%). Prices per lb of alloy, contract or spot, bulk, carlots 14.50c; packed, carlots 15.25c, ton lots 16.00c, smaller lots 16.75c, eastern, freight allowed; 14.80c, 15.55c, 17.10c, 17.85c, central; 14.80c, 15.55c, 19.05c, 19.80c, western.

Zirconium alloy: 12-15%, per lb of alloy, eastern, contract, bulk, carlots 5.50c, packed, carlots 6.05c, ton lots 6.40c, smaller lots 6.75c; spot up 0.25c.

Zirconium alloy: Z 35-40%, eastern, contract, packed, carlots 17.00c, ton lots 17.75c, smaller lots 19.00c; spot up 0.25c.

Alsifer: (Approx. 20% Al, 40% Si, 40% Fe) Contract basis fob Niagara Falls, N. Y., lump per lb 6.25c; ton lots 6.75c; smaller lots 7.25c. Spot up ½c.

Simanal: (Approx. 20% each Si, Mn, Al) Packed, lump, carload 9c, ton lots 9.25c, smaller lots 9.75c per lb alloy; freight not exceeding St. Louis rate allowed

Tungsten Metal Powder: Spot, not less than 98.8%, $2.90, freight allowed as far west as St. Louis.

Grainal: Vanadium Grainal No. 1 87.5c; No. 6, 60c; No. 79, 45c; all fob Bridgeville, Pa., usual freight allowance.

Vanadium Pentoxide, technical grade: Fused, approx. 89-92% V_2O_5 and 5.84% Na_2O; or air dried, 83-85% V_2O_5 and 5.15% Na_2O, $1.10 per lb contained V_2O_5 fob plant freight allowed on quantities of 25 lb and over to St. Louis.

Funds Appropriated for Stockpiling Metals

House also passes Allen bill, providing premium payments for copper, lead, zinc and manganese

NEW YORK — Two important actions were taken in Congress last week affecting nonferrous metal industries. The House approved an appropriation of $100 million cash and $50 million in contract authorizations for the stockpiling of strategic and critical materials during the current fiscal year.

The House also passed the Allen bill, extending the Premium Price Plan for copper, lead and zinc for two years from June 30, 1947. Payments by the Reconstruction Finance Corp. at the rate of $35 million a year for the 1948 and 1949 fiscal periods were authorized. Manganese is now included in the premium payment plan, with payments for this metal estimated at not over $1,500,000 for the first year and $3 million for the second year. The bill provides that no payment for manganese shall be made to a producer when the base market price plus such payment would exceed $1 per unit (22.4 pounds) of contained manganese. It also stipulates that payments shall be made only on marketable ores or concentrates containing in excess of 35 per cent metallic manganese.

COPPER — A slightly easier price tone developed in the foreign copper market last week due to the inability of consumers abroad to get sufficient dollars to purchase the much needed metal. Prices ranged from 20.50c to 21.50c a pound at New York. The lower level of the range represented price paid for December delivery while 20.75c was obtained for August and September shipment to European destinations from sellers who market output of smaller foreign producers. The large producers of foreign copper are adhering to the 21.50-cent level. Price of copper to domestic consumers held at 21.50c, Connecticut Valley base.

Magma Copper Co. has entered into a loan agreement with Bankers Trust Co. and Mutual Life Insurance Co. of New York for funds in a minimum amount of $1,750,000 and a maximum amount of $3,500,000 to be used to start underground development of the new large low-grade copper ore body on the property of the company's subsidiary San Manuel Copper Corp.

There are 103,944 tons of refined copper contained in products shipped during June from plants of brass mills, wire mills and other makers of copper and brass products. This compares with 113,157 tons shipped during May. Total receipts of new copper at these plants aggregated 117,119 tons last month against 116,918 tons in the preceding month. Because receipts were larger than shipments, manufacturers of copper products added 12,987 tons to their supplies on hand, which totaled 412,932 tons at the end of June compared with 408,945 tons at the end of May.

Fabricators of copper booked new business last month requiring 84,140 tons of copper, a drop of 43,368 tons from the 127,508 tons booked during the previous month. Unfilled orders at the end of June totaled 449,790 tons compared with 469,594 tons at the end of May.

Manufacturers' needs for copper at the close of June totaled 727,726 tons, including 277,936 tons for working stocks and 449,790 tons for orders on hand. To meet these requirements, the supply was 507,302 tons, including 421,932 tons on hand and 85,370 tons in unfilled orders with producers. This left an apparent deficit of 220,424 tons at the end of June compared with a deficit of 251,175 tons at the end of May.

LEAD — Continuation of the high rate of lead production was threatened last week by demands of workers for a new wage agreement, although so far all plants have maintained normal operations. St. Joseph Lead Co. reached an agreement with the International Union of Mine, Mill & Smelter Workers (CIO) while negotiations were still going forward with the American Smelting & Refining Co. Consumers are absorbing all lead offered on a quota basis for August delivery at the firm price level of 14.80c to 14.85c, St. Louis, for the common grade.

ZINC — Trading in zinc futures was resumed last week on the Commodity Exchange after more than six years' suspension due to World War II. A new schedule of freight differentials was established in the zinc futures contract for designated delivery points. Unit of trading is 30 tons, or 60,000 pounds. Delivery is on the basis of prime western in slabs. Other deliverable grades include special high grade, intermediate, brass special and select. The following margin requirements are in effect: For each regular contract, calling for delivery of 30 tons of basic prime western slab zinc, $750; for hedging contracts, $500; and for straddle operations, $250 per contract.

Federated Metals Division is operating its new $200,000 zinc smelter at Los Angeles fully on production of intermediate grade zinc.

TIN — All interests in the tin market followed developments in the Dutch-Indonesian conflict closely last week due to its possible effect on the availability of tin from that section of the world. It was pointed out that if trouble in the Dutch East Indies interferes with the movement of pig tin, supplies in 1948 may fall below those expected this year.

ALUMINUM — May shipments of aluminum castings declined for the second consecutive month in May, totaling 37 million pounds, or 10 per cent below April shipments, according to the Bureau of the Census. Primary aluminum prices held unchanged at 15.00c for ingots.

SILVER — Handy & Harman's official silver prices declined to 61.75c, New York, last week. Silversmiths were cautious buyers of foreign metal, resulting in an accumulation of foreign silver supplies. However, the Mexican government has arranged to buy another 2 million ounces of silver for coinage purposes from Mexican producers. This buying is expected to have a stabilizing influence on foreign silver in the New York market.

NONFERROUS METAL PRICES

Copper: Electrolytic, carlots 21.50c, delivered Conn.; Lake, 21.62½c, del. Conn. Dealers may add ¾c for 5000 lb to carload; 1c, 1000-4999 lb; 1½c, 500-999 lb; 2c, 0-499 lb. Casting, nom., refinery, 20,000 lb or more; nom., less than 20,000 lb.

Brass Ingot: 85-5-5-5 (No. 115) 18.00c; 88-10-2 (No. 215) 26.25c; 80-10-10 (No. 305) 22.00c; No. 1 yellow (No. 405) 14.50c; carlot prices, including 25c per 100 lb freight allowance; add ¼c for less than carloads.

Zinc: Prime western 10.50c, brass special 10.75c, intermediate 11.00c, E. St. Louis; high grade 11.50c, del., carlots. For 20,000 lb to carlots add 0.15c; 10,000-20,000 lb 0.25c; 2000-10,000 lb 0.4c; under 2000 lb 0.50c.

Lead: Common 14.80c-14.85c, chemical 14.90c, corroding 14.90c, E. St. Louis for carlots.

Primary Aluminum: 99% plus, ingots 15.00c del., pigs 14.00c del.; metallurgical 94% min. 13.50c del. Base 10,000 lb and over; add ½c 2000-9999 lb; 1c less through 2000 lb.

Secondary Aluminum: Piston alloy (No. 122 type) 13.75c; No. 12 foundry alloy (No. 2 grade) 13.25c; steel deoxidizing grades, notch bars, granulated or shot: Grade 1 (95-97½%) 14.50c; grade 2 (92-95%) 12.50c; grade 3 (90-92%) 11.75c; grade 4 (85-90%) 11.00c. Above prices for 30,000 lb or more; add ¼c 10,000-30,000 lb; ½c 5000-10,000 lb; ¾c 1000-5000 lb; 1¼c less than 1000 lb. Prices include freight at carload rate up to 75c per 100 lb.

Magnesium: Commercially pure (99.8%) standard ingots (4-notch, about 20 lb), 10,000 lb and over, 20.50c; 2000 to 9999 lb, 21.50c; 100 to 1999 lb, 22.50c. Extruded rounds, 12 inches long, 1.312 inches in diameter, less than 25 lb, 52.00c-56.00c; 25 to 99 lb, 42.00c-46.00c; 100 to 4000 lb, 35.00c-36.00c.

Tin: Prices ex-dock, New York in 5-ton lots. Add 1 cent for 2240-11,199 lb, 1½c 1000-2239, 2½c 500-999, 3c under 500. Grade A, 99.8% or higher (includes Straits), 80.00c; Grade B, 99.8% or higher, not meeting specifications for Grade A, with 0.05% max. arsenic, 79.85c; Grade C, 99.65-99.79% incl. 79.55c; Grade D, 99.50-99.64% incl., 79.40c; Grade E, 99-99.49% incl. 78.90c; Grade F, below 99% (for tin content), 78.70c.

Antimony: American bulk carlots fob Laredo, Tex., 99.0% to 99.8% and 99.8% and over but not meeting specifications below, 33.00c; 99.8% and over (arsenic, 0.05% max.; other impurities, 0.1% max.) 33.50c, effective as of Mar. 15. On producers' sales add ¼c for less than carload to 10,000 lb; ½c for 9999-224 lb; add 2c for 223 lb and less; on sales by dealers, distributors, and jobbers add ½c, 1c, and 3c, respectively.

Nickel: Electrolytic cathodes, 99.9%, base sizes at refinery, unpacked 35.00c lb; 25 lb pigs produced from electrolytic cathodes 36.50c lb; shot produced from electrolytic cathodes 37.50c lb; "F" nickel shots or ingots for additions to cast iron 35.50c lb. Prices include import duty.

Mercury: Open market, spot, New York, $84-$87 per 76-lb flask.

Arsenic: Prime, white, 99%, carlots, 4.00c lb

Beryllium-Copper: 3.75-4.25% Be, $17 per lb contained Be.

Cadmium: Bars, ingots, pencils, pigs, plates, rods, slabs, sticks, and all other "regular" straight or flat forms $1.75 lb, del.; anodes, balls, discs and all other special or patented shapes, $1.80.

Cobalt: 97-98%, $1.65 lb for 550 lb (keg); $1.67 lb for 100 lb (case); $1.72 lb under 100 lb.

Gold: U. S. Treasury, $35 per ounce.

Indium: 99.9%, $2.25 per troy ounce.

Silver: Open market, N. Y., 61.75c, per ounce.

Platinum: $53-$56 per ounce.

Palladium: $24 per troy ounce.

Iridium: $80-$90 per troy ounce.

Rolled, Drawn, Extruded Products

(Copper and brass products prices based on 21.50c, Conn., for copper. Freight prepaid on 100 lb or more.)

Sheet: Copper 33.68c; yellow brass 29.63c; commercial bronze, 95% 33.72c, 90% 33.11c, red brass, 85% 31.99c, 80% 31.38c; best quality 30.64c; Everdur, Duronze, Herculoy or equiv., cold-drawn, 38.44c; nickel silver, 18%, 42.49c; phosphor bronze, grade A, 5%, 52.00c.

Rods: Copper, hot rolled 30.03c, cold drawn 31.03c; yellow brass, free cutting, 24.39c; commercial bronze, 95% 33.41c, 90% 32.80c; red brass, 85% 31.68c, 80% 31.07c; best quality 30.33c.

Seamless Tubing: Copper 33.72c; yellow brass 32.39c; commercial bronze 90% 35.52c; red brass 85% 34.65c, 80% 34.04c; best quality brass 33.05c.

Wire: Yellow brass 29.92c; commercial bronze, 95% 34.01c, 90% 33.40c; red brass, 85% 32.28c, 80% 31.67c; best quality brass 30.93c.

Copper Wire: Bare, soft, fob eastern mills, carlots 27.72c, less carlots 28.22c; weatherproof, fob eastern mills carlots 28.12c, less carlots 28.62c; magnet, delivered, carlots 29.75c-31.13c, 15,000 lb or more 30.00c-31.38c, less carlots 30.50c-31.88c.

Aluminum Sheets and Circles: 2s and 3s flats, mill finish, base 30,000 lb or more, fob shipping point. Actual transportation charges (not to exceed lowest carload rail freight rate) are deducted on orders for domestic delivery of 500 lb or more of one product to one destination. Widths from 12 in. and diameters from 9 in. to indicated maximum sizes. Prices, cents per lb, effective Jan. 30, 1947.

B. & S. Gage	Max. Width or Diam.	Sheet Base	Circle Base
0.0249"-7	48"	23.70	26.20
8-10	48"	24.20	26.70
11-12	26"	24.70	27.50
13-14	26"	24.90	27.90
15-16	26"	25.10	28.20
17-18	26"	25.40	28.60
19-20	24"	25.70	29.00
21-22	24"	26.10	29.50
23-24	24"	26.60	30.20
25	24"	27.10	30.90
26	24"	27.80	31.90
27	24"	28.50	33.00
28	24"	29.20	33.70
29	24"	30.00	34.70
30	24"	30.80	35.80

Lead Products: Prices to jobbers: Sheets, full rolls, 140 sq ft or more, 18.25c; add per hundredweight, 25c, 80 to 140 sq ft; 50c, 20 to 80 sq. ft; 75c, 10 to 20 sq ft and circles.
Pipe: Full coils 17.50c; cut coils 17.75c.
Lead Traps and Bends: List plus 42%.

Zinc Products: Sheet, 15.50c, fob mill, 36,000 lb and over. Ribbon zinc in coils, 14.50c, fob mill, 36,000 lb and over. Plates, not over 12-in., 13.50c; over 12-in., 14.50c.

Plating Materials

Chromic Acid: 99.75%, flake, fob Philadelphia, carloads, 21.00c; 5 tons and over 21.50c; 1 to 5 tons, 22.00c; less than 1 ton, 22.50c.

Copper Anodes: Base, 2000 to 5000 lb; fob shipping point, freight allowed: Flat untrimmed, 29.84c; oval, 29.34c; electrodeposited, 29.09c; cast, 28.84c.

Copper Carbonate: 52-54% metallic Cu, 50 lb bags, 26.50c.

Copper Cyanide: 70-71% Cu, 100-lb drums, 45.00c fob Cleveland.

Sodium Cyanide: 96-98%, ½-oz ball, in 100 or 200 lb drums, 1 to 400 lb, 16.00c, 500 lb and over, 15.00c, fob Cleveland; 1 cent less, fob Niagara Falls.

Nickel Anodes: Rolled oval, carbonized, carloads, 48.00c; 10,000 to 30,000 lb, 49.00c; 3000 to 10,000 lb, 50.00c; 500 to 3000 lb, 51.00c; 100 to 500 lb, 53.00c; under 100 lb, 56.00c; add 1 cent for rolled depolarized.

Nickel Chloride: 100-lb kegs, 22.00c; 275-lb bbls, 20.00c.

Tin Anodes: Bar, 1000 lb and over 92.50c; 500 to 1000 lb, 93.00c; 200 to 500 lb, 93.50c; less than 200 lb, 94.00c; ball, 1000 lb and over, 94.75c; 500 to 1000 lb, 95.25c; 200 to 500 lb. 95.75c; less than 200 lb, 96.25c, fob Sewaren, N. J.

Tin Chloride: Fob Grasselli, N. J., 625 lb bbls., 60.00c; 100 lb kegs, 60.50c.

Sodium Stannate: To all consumers: in 200 or 500 lb drums, 49.50c; 100 lb, 50.50c; 50 lb, 55.00c; 25 lb, 57.00c.
To consumers other than automobile, radio and refrigerator makers: 1500 lb, 45.85c; 600 to 1400 lb, 48.50c.
To automobile, radio and refrigerator makers: 10,000 lb and over, 44.50c; 2000 to 9999 lb. 45.50c; 1000 to 1999, 46.50c; 600 to 999 lb, 48.50c.

Zinc Cyanide: 100-lb drums 36.00c, fob Cleveland; 35.00c, fob Niagara Falls.

Scrap Metals

BRASS MILL ALLOWANCES

(Based on 21.50c, Conn., for copper)
Prices for less than 15,000 lb fob shipping point. Add ¾c for 15,000-40,000 lb; 1c for 40,000 or more.

	Clean Heavy	Rod Ends	Clean Turnings
Copper	19.125	19.125	18.375
Yellow brass	15.125	14.875	14.250
Commercial Bronze			
95%	18.000	17.750	17.250
90%	17.500	17.250	16.750
Red brass			
85%	17.250	17.000	16.500
80%	16.875	16.625	16.125
Best Quality (71-79%)	16.125	15.875	15.375
Muntz Metal	14.125	13.875	13.375
Nickel silver, 5%	16.125	15.875	8.063
Phos. bronze, A. B.	20.000	19.750	18.750
Naval brass	14.500	14.250	13.750
Manganese bronze	14.500	14.250	13.625

BRASS INGOT MAKERS BUYING PRICES

(Cents per pound, fob shipping point, carload lots)

No. 1 copper 17.00, No. 2 copper 15.50, light copper 14.00, composition red brass 12.75, auto radiators 9.50, heavy yellow brass 8.75, brass pipe 9.25.

REFINERS' BUYING PRICES

(Cents per pound, delivered refinery, carload lots)

No. 1 copper 17.00-17.50c, No. 2 copper, 15.50-16.00, light copper, 14.50-15.00, refinery brass (60% copper), per dry copper content less $5 smelting charge for brass analyzing 60 per cent or more, 13.62½.

DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots or more)

Copper and Brass: Heavy copper and wire, No. 1 15.00-15.50, No. 2 13.75-14.00, light copper 12.50-13.00; No. 1 composition red brass 11.00-11.50, No. 1 composition turnings 10.00-10.50, mixed brass turnings 5.50-6.00, new brass clippings 12.00-12.50, No. 1 brass rod turnings 10.50-11.00, light brass 4.75-5.00, heavy yellow brass 6.50-7.00, new brass rod ends 11.00-11.50, auto radiators, unsweated 8.50-8.75, cocks and faucets 8.50-9.00, brass pipe 8.25-8.50.

Lead: Heavy lead 10.50-11.00, battery plates 6.00-6.25, linotype and stereotype 12.25-12.50, electrotype 10.75-11.00, mixed babbitt 11.00-11.50, solder joints 15.50-16.00.

Zinc: Old zinc 5.00-5.50, new die cast scrap 3.75-4.00, old die cast scrap 2.00-2.50.

Tin: No. 1 pewter 50.00-52.00, block tin pipe 67.00-68.00, auto babbitt 40.00-42.00, No. 1 babbitt 40.00-43.00, siphon tops 40.00-42.00.

Aluminum: Clippings, 2S, 7.50-8.00, old sheets 5.00-5.50, crankcase 4.00-4.50, borings and turnings 2.00, pistons, free of struts, 4.00-4.50.

Nickel: Anodes 18.50-19.00, turnings 15.50-16.50, rod ends 18.00-19.00.

Monel: Clippings 13.00-14.00, turnings 7.50-8.00, old sheet 11.00-12.00, rods 11.50-12.50, castings 9.00.

OPEN MARKET PRICES, IRON AND STEEL SCRAP

Prices are dollars per gross ton, including broker's commission, delivered at consumer's plant except where noted.

PITTSBURGH

No. 1 Heavy Melt. Steel	$38.00-39.00
No. 2 Heavy Melt. Steel	38.00-39.00
No. 1 Busheling	38.00-39.00
Nos. 1, 2 & 3 Bundles	38.00-39.00
Machine Shop Turnings	31.00-31.50
Mixed Borings, Turnings	31.00-31.50
Short Shovel Turnings	33.00-33.50
Cast Iron Borings	32.00-32.50
Bar Crops and Plate	40.00-41.00
Low Phos. Cast Steel	40.00-41.00
Punchings & Plate Scrap	40.00-41.00
Cut Structurals	40.00-41.00
Elec. Furnace Bundles	40.00-41.00
Heavy Turnings	31.50-32.00
No. 1 Chemical Borings	31.50-32.50

Cast Iron Grades

No. 1 Cupola	40.50-41.50
Charging Box Cast	35.50-36.00
Heavy Breakable Cast.	34.50-35.00
Stove Plate	37.50-38.00
Unstripped Motor Blocks	37.50-38.00
Malleable	48.00-49.00
Brake Shoes	35.00-36.00
Clean Auto Cast	40.00-41.00
No. 1 Wheels	42.00-42.50
Burnt Cast	35.00-36.00

Railroad Scrap*

No. 1 R.R. Heavy Melt.	39.50-41.50
R.R. Malleable	48.00-49.00
Axles	40.00-41.00
Rails, Rerolling	37.00-37.50
Rails, Random Lengths	39.00-39.50
Rails, 3 ft and under	40.50-41.00
Rails, 18 in. and under	42.00-42.50
Railroad Specialties	44.00-44.50
Uncut Tires	39.00-40.00
Angles, Splice Bars	39.00-40.00

* Brokers buying prices.

CLEVELAND

No. 1 Heavy Melt. Steel	$37.50-38.00
No. 2 Heavy Melt. Steel	37.50-38.00
No. 1 Busheling	37.50-38.00
Nos. 1 & 2 Bundles	37.50-38.00
Machine Shop Turnings	30.00-30.50
Mixed Borings, Turnings	31.50-32.00
Short Shovel Turnings	31.50-32.00
Cast Iron Borings	31.50-32.00
Bar Crops and Plate	40.00-40.50
Cast Steel	45.00-46.00
Punchings & Plate Scrap	40.00-40.50
Elec. Furnace Bundles	39.00-39.50
Heavy Turnings	37.00-37.50
Alloy Free Turnings	31.00-31.50
Cut Structurals	40.00-40.50

Cast Iron Grades

No. 1 Cupola	46.00-48.00
Charging Box Cast	42.00-44.00
Stove Plate	40.00-42.00
Heavy Breakable Cast.	40.00-42.00
Unstripped Motor Blocks	43.00-44.00
Malleable	56.00-57.00
Brake Shoes	42.00
Clean Auto Cast	47.00
No. 1 Wheels	45.00
Burnt Cast	40.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	39.00-39.50
R.R. Malleable	56.00-57.00
Rails, Rerolling	44.00-45.00
Rails, Random Lengths	44.00-45.00
Rails, 3 ft and under	46.00-47.00
Railroad Specialties	46.00
Uncut Tires	44.00
Angles, Splice Bars	47.00

VALLEY

No. 1 Heavy Melt. Steel	$35.00-38.00
No. 2 Heavy Melt. Steel	35.00-38.00
No. 1 Bundles	35.00-38.00
Machine Shop Turnings	31.00-31.50
Short Shovel Turnings.	31.50-32.00
Cast Iron Borings	31.50-32.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	39.00-39.50

MANSFIELD

No. 1 Heavy Melt. Steel	$33.00-34.50
Machine Shop Turnings.	31.00-31.50
Short Shovel Turnings.	31.00-31.50

CINCINNATI

No. 1 Heavy Melt. Steel	$35.00
No. 2 Heavy Melt. Steel	35.00
No. 1 Busheling	35.00
No. 1 Bundles	35.00
No. 2 Bundles	35.00
Machine Shop Turnings	29.00
Mixed Borings, Turnings	28.00
Short Shovel Turnings.	31.00
Cast Iron Borings	30.00

Cast Iron Grades

No. 1 Cupola Cast	46.00
Charging Box Cast	37.00
Heavy Breakable Cast.	38.50
Stove Plate	35.00
Unstripped Motor Blocks	37.00
Brake Shoes	34.00
Clean Auto Cast	44.00
Drop Broken Cast	48.00

Railroad Scrap

No. 1 R.R. Heavy Melt	39.00
R.R. Malleable	54.00
Rails, Rerolling	43.50
Rails, Random Lengths	43.00
Rails, 18 in. and under	48.00

DETROIT

(Dealers buying prices, fob shipping point)

No. 1 Heavy Melt. Steel	$31.00-31.50
No. 1 Busheling	31.00-31.50
Nos. 1 & 2 Bundles	31.00-31.50
No. 3 Bundles	31.00-31.50
Machine Shop Turnings	26.50-27.00
Mixed Borings, Turnings	26.50-27.00
Short Shovel Turnings.	28.50-29.00
Cast Iron Borings	28.50-29.00
Punchings & Plate Scrap	38.00-38.50

Cast Iron Grades

No. 1 Cupola Cast	34.00-35.00
Heavy Breakable Cast.	26.00-27.00
Clean Auto Cast	34.00-35.00

BUFFALO

No. 1 Heavy Melt. Steel	$41.50
No. 2 Heavy Melt. Steel	38.00
No. 1 Busheling	38.00
Nos. 1 & 2 Bundles	38.00
Machine Shop Turnings	29.00-30.00
Mixed Borings, Turnings	29.00-30.00
Cast Iron Borings	29.00-30.00
Short Shovel Turnings.	30.00-31.00
Punchings & Plate Scrap	40.00-41.00
Elec. Furnace Bundles.	40.00-41.00

Cast Iron Grades

No. 1 Cupola Cast	35.00-38.00
Heavy Breakable Cast.	33.00-34.00
Malleable	38.00-39.00
No. 1 Wheels	35.00-36.00

PHILADELPHIA

No. 1 Heavy Melt. Steel	$39.00-40.00
No. 2 Heavy Melt. Steel	39.00-40.00
No. 1 Busheling	39.00-40.00
No. 1 Bundles	39.00-40.00
No. 2 Bundles	39.00-40.00
No. 3 Bundles	36.00-37.00
Machine Shop Turnings	30.00-31.00
Mixed Borings, Turnings	28.50-29.00
Short Shovel Turnings.	31.50-32.00
Bar Crops and Plate	43.00-44.00
Punchings & Plate Scrap	43.00-44.00
Cut Structurals	42.00-43.00
Elec. Furnace Bundles.	40.50-41.00
Heavy Turnings	39.00-39.50
No. 1 Chemical Borings	32.00-33.00

Cast Iron Grades

No. 1 Cupola Cast	47.00-48.00
Charging Box Cast	46.00-47.00
Heavy Breakable Cast.	45.50-46.50
Unstripped Motor Blocks	41.00-41.50
Malleable	55.00-57.00
Clean Auto Cast	47.00-48.00
No. 1 Wheels	47.50-48.00

NEW YORK

(Dealers buying prices, fob shipping point)

No. 1 Heavy Melt. Steel	$35.25
No. 2 Heavy Melt. Steel	35.25
No. 1 Busheling	35.25
Nos. 1 & 2 Bundles	35.25
No. 3 Bundles	32.25
Machine Shop Turnings	25.00-25.50
Mixed Borings, Turnings	25.00-25.50
Short Shovel Turnings.	27.00-27.50
Punchings & Plate Scrap	37.00-37.50
Cut Structurals	37.00-37.50
Elec. Furnace Bundles.	36.25-36.50
No. 1 Chemical Borings	24.50-25.00

Cast Iron Grades

No. 1 Cupola Cast	41.50-42.00
Charging Box Cast	41.50-42.00
Heavy Breakable	41.50-42.00
Unstripped Motor Blocks	35.00-36.00
Malleable	51.00-53.00

BOSTON

(Fob shipping point)

No. 1 Heavy Melt. Steel	$33.50-34.00
No. 2 Heavy Melt. Steel	33.50-34.00
Nos. 1 & 2 Bundles	33.50-34.00
No. 1 Busheling	33.50-34.00
Machine Shop Turnings	26.00-26.50
Mixed Borings, Turnings	25.00-25.50
Short Shovel Turnings.	28.00-28.50
Bar Crops and Plate	35.50-36.50
Punchings & Plate Scrap	35.50-36.50
Chemical Borings	26.00-27.00

Cast Iron Grades

No. 1 Cupola Cast	42.00-44.00
Charging Box Cast	38.00
Heavy Breakable Cast.	38.00-39.00
Stove Plate	36.00-37.00
Unstripped Motor Blocks	32.00-34.00
Clean Auto Cast	40.00-42.00

CHICAGO

No. 1 Heavy Melt. Steel	$39.00-39.50
No. 2 Heavy Melt. Steel	39.00-39.50
No. 1 & 2 Bundles	39.00-39.50
No. 3 Bundles	37.00-37.50
Machine Shop Turnings	35.50-36.50
Mixed Borings, Turnings	35.50-36.50
Short Shovel Turnings	34.00-34.50
Cast Iron Borings	35.00-35.50
Bar Crops and Plate	41.00-42.00
Cast Steel	41.00-42.00
Punchings	41.00-42.00
Elec. Furnace Bundles.	41.00-42.00
Heavy Turnings	38.50-39.00
Cut Structurals	41.00-42.00

Cast Iron Grades

No. 1 Cupola Cast	42.00-45.00
Malleable	42.00-45.00
Clean Auto Cast	42.00-45.00
No. 1 Wheels	42.00-45.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	40.50-41.00
Rails, Rerolling	46.50-47.00
Rails, Random Lengths	45.50-46.00
Rails, 3 ft. and under.	46.50-47.00
Rails, 18 in. and under	47.50-48.50
Railroad Specialties	46.50-47.00
Angles, Splice Bars	46.50-47.00

ST. LOUIS

No. 1 Heavy Melt. Steel	$36.00-37.00
No. 2 Heavy Melt. Steel	35.00-36.00
Machine Shop Turnings	30.00-31.00
Short Shovel Turnings.	32.00-33.00

Cast Iron Grades (Fob shipping point)

No. 1 Cupola Cast	43.00-44.00
Charging Box Cast	37.00-38.00
Heavy Breakable Cast.	35.00-36.00
Brake Shoes	38.00-39.00
Clean Auto Cast	43.00-44.00
Burnt Cast	35.00-37.00

Railroad Scrap

R.R. Malleable	54.00-55.00
Rails, Rerolling	42.00-44.00
Rails, Random Lengths	40.00-41.00
Rails, 3 ft and under	43.00-45.00
Uncut Tires	38.50-39.50
Angles, Splice Bars	38.00-40.00

BIRMINGHAM

No. 1 Heavy Melt. Steel	$36.00
No. 2 Heavy Melt Steel	36.00
No. 1 Busheling	36.00
Nos. 1 & 2 Bundles	36.00
No. 3 Bundles	31.00
Long Turnings	24.50
Short Shovel Turnings.	26.00-27.00
Cast Iron Borings	25.00
Bar Crops and Plate	38.50
Cut Structurals	38.50

Cast Iron Grades

No. 1 Cupola Cast	41.00
Stove Plate	39.00
No. 1 Wheels	36.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	37.00
R.R. Malleable	42.50
Axles, Steel	39.00
Rails, Rerolling	41.00
Rails, Random Length.	39.00
Rails, 3 ft and under	41.00
Angles and Splice Bars.	41.00

SAN FRANCISCO

No. 1 Heavy Melt. Steel	*$19.04
No. 2 Heavy Melt. Steel	*19.04
No. 1 Busheling	*19.04
Nos. 1 & 2 Bundles	*19.04
No. 3 Bundles	*17.04
Machine Shop Turnings	*12.54
Bar Crops and Plate	18.00
Cast Steel	18.00
Alloy Free Turnings	8.00
Cut Structurals	20.00-20.50
Tin Can Bundles	17.00

Railroad Scrap

Axles	26.50
Rails, Random Lengths	21.00
Uncut Tires	28.00

*Fob California shipping point.

SEATTLE

No. 1 Heavy Melt. Steel	$20.00
No. 2 Heavy Melt. Steel	20.00
No. 1 Busheling	20.00
Nos. 1 & 2 Bundles	20.00
No. 3 Bundles	18.00
Machine Shop Turnings	11.50
Mixed Borings, Turnings	11.50
Punchings & Plate Scrap	21.50
Cut Structurals	21.50

Cast Iron Grades

No. 1 Cupola Cast	27.50
Charging Box Cast	22.50
Heavy Breakable Cast.	21.50
Stove Plate	23.00
Unstripped Motor Blocks	21.50
Malleable	27.50
Brake Shoes	27.50
Clean Auto Cast	27.50
No. 1 Wheels	24.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	20.00
Railroad Malleable	27.50
Rails, Random Lengths	20.00
Angles and Splice Bars	21.50

LOS ANGELES

No. 1 Heavy Melt. Steel	$19.50
No. 2 Heavy Melt. Steel	19.50
Nos. 1 & 2 Bundles	19.50
Machine Shop Turnings	14.50
Mixed Borings, Turnings	14.50
Punchings & Plate Scrap	27.50
Elec. Furnace Bundles	27.00

Cast Iron Grades

No. 1 Cupola Cast	30.00

Sheets, Strip . . .

Two galvanized sheet producers advance prices $7 to $10 a ton

Sheet Prices, Page 114

Philadelphia — Sheet allocations are expected for fourth quarter this week, with indications carryovers will range from four to six weeks and prospects are slim for any increase in tonnage for consumers. In some cases outlook is for smaller quotas. Meanwhile sheet users have limited inventories and are operating to the extent flat-rolled steel is available.

Galvanized is among the shortest grades, one small producer has raised prices $10 ton, another has advanced some grades up to $7, but this increase is not yet general, although opinion holds that the rise in galvanized will be substantial. So cramped for sheet tonnage are some consumers, they offer to place orders fob mills in dislocated areas and pay freight.

Boston—Nonintegrated narrow strip mills are booking orders for fourth quarter. Although tonnage for the period is allocated and schedules filling, indications are scattered users may not take quotas in full. Therefore, there may be spot openings. New volume is somewhat lower as consumers are more cautious on inventories. Although order backlogs are heavy, chain requirements are slightly lower. Improvements in supply of hot strip for rerolling is spotty; where tonnage is heavier, one mill is largely responsible, stepping up hot strip production for cold rolling, temporarily at least. All classifications of sheets will continue tight through fourth quarter. Allocations are on a level with the third or slightly below.

New York—Sheet mills on a monthly scheduling basis have reduced some quotas by one-fifth with indications those operating on a full quarter allocation schedule will have no more new tonnage to offer than in the third. October, at least, will be a lean month with numerous consumers. More and more metalworking shops are adjusting schedules to flat-rolled supply and prospects. They are also placing new orders for other steel products with an eye to sheets. Sheet inventories, depleted or non-existant for reconversion, have never been built up to normal working levels; instead tonnage taken in has gone largely into heavier production and inventories did not accumulate. Once inventories are in normal balance, buying may be expected to follow replacement needs, but that time is still some distance away.

Chicago—Pressure for sheet and strip from consumers continues unabated, despite widespread closing for vacations. No instances of cancellations or postponements of deliveries has been noted, and plants closed for vacations often keep receiving departments open to accommodate incoming deliveries.

Mills report customers are taking allotments, even though sizes and qualities do not meet exact demand. Customers accept deliveries and then arrange trades with other customers to get items needed. Instances of three, four or five parties to such swaps are noted.

Chicago producers doubt that prices will be advanced before mid-August and generally refuse to speculate on amount of increase on flat-rolled items. Some believe that stainless and alloy sheets will not be advanced.

Cleveland—Producers have been unable to maintain shipping schedules, resulting in a steady increase in order backlogs. Indications now are that October quotas will not be issued by several companies, shipments during that period being applied entirely to unfilled business. Demand has shown no sign of easing while production has been curtailed by interruptions due to vacations and reduced operations resulting from the recent coal tieup. Some mills have lost the equivalent to one month's production during the current quarter.

Cincinnati — Having hurdled the coal mine stoppages, sheet mills in this district anticipate uninterrupted production throughout the remainder of the year, yet fail to see any major relief from supply stringency. Requests for fourth quarter delivery positions continue and, as heretofore, appeals are made for more tonnage.

Birmingham — Sheet production remains at virtual capacity in the South with completion of cold-rolling facilities eagerly awaited to take care of a substantial portion of the current overage in demand in this section. Inadequacy of sheet supplies has cost the district some diversified industrial endeavor. Processors are not adequately supplied on a month-to-month basis in most instances. A moderate tonnage of cotton ties is being produced here.

St. Louis—Sheet producers are perplexed by the total absence of any easing in demand for flat-rolled steel. If any consumers have abated their clamor in order to readjust their inventories, the effect has not been felt here. Mills report demand is increasing constantly. Their order books are shrinking for the sole reason they are taking no new orders. They are sold to the yearend on all major items and have set no dates for opening 1948 schedules. Mills expect to raise prices about $5 a ton next month. Shipments of sheets were disappointingly small in July in this area, due principally to the aftermath of Granite City Steel Co.'s two and one-half month machinists' strike. Its ingot production was fair, being hampered by poor quality scrap, but shipments were only 60 per cent of normal because of the necessity of refilling pipelines drained by the strike. Completion of the firm's new cold-rolling mill, first scheduled for Aug. 1, has been set back again to October or November, with operations probable by mid-January.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 114

Portland, Oreg. — Demand for reinforcing steel in this area is steady and in excess of supplies. Industrial and private construction is active. Houses jobbing reinforcing bars report mills are unable to meet their requirements. Many small tonnages are being booked. State highway projects involve considerable steel.

Mercer Steel Co. is furnishing 750 tons for the Oregonian newspaper plant. Soule Steel Co. has an award of 150 tons for an engineering building at Oregon State College, Corvallis, Oreg. John King & Co., Yakima, Wash., is low at $108,051 for two major pumping plants. Ioza project, involving about 50 tons of reinforcing steel and 550 tons of pumps, penstocks, trashracks and other items.

Wire . . .

Pittsburgh Steel Co. eliminates premium on nails and now quotes 3.75 base

Wire Prices, Page 115

Pittsburgh—Tight wire supply situation shows no signs of abating. Limited stocks of manufacturers' and merchant wire items were further depleted during the interruption to mill production schedules and plant vacation shutdown during recent weeks. Acute shortage of wire rods continues to restrict output of nonintegrated interests, although integrated producers' production schedules are back to capacity levels. In most instances jobbers' inventories of merchant wire items are unbalanced and well below normal. The expected easing in overall supply of nails has not yet materialized, although industry's production is said to be over 70,000 tons monthly. No change has developed in requirements for wire rope from the somewhat depressed volume of recent months. Very heavy demand persists for all types of drawn and spring wire items, cold-heading wire being particularly scarce for fastener trade.

Pittsburgh Steel Co. is no longer charging premium price of $4.50 per hundred pounds for standard and cement-coated galvanized nails and staples; company is now selling on a $3.75 base.

New York—While total volume of incoming orders is down slightly, there are numerous grades on which demand has not slackened. Some mills are booking for fourth quarter and the balance are expected to open books this week. Due to suspensions earlier this month, new orders have been well in excess of shipments, but are approaching 50-50 balance as the month ends. High-carbon specialty wire order backlogs are sufficient to carry through the balance of this year on most items and the same is true of manufacturers' wire. Upholstery and furniture spring demand is spotty. Inroads on spring wire backlogs have been made by utilizing some of the expanded capacity for rope wire. Nails are in short supply and little midwest output is coming east for distribution. Rods will continue the major problem for some mills through fourth quarter.

Boston—Spring wire demand is tapering and in some sizes music wire can be supplied from stock. Most mills have opened books for fourth quarter and schedules are filling. Allocations for the period continue on most wire items and backlog for manufacturers' wire is heavy as in most high carbon specialties. There is some easing in demand in some directions due to inventory considerations with other products, but pressure for tonnage from the automobile industry is sustained. Low carbon heading, resulphurized basic and preformed stapling wire are in strong demand; users of the latter are asking for double the prewar tonnage in some cases. Unable to get enough rods, screw manufacturers are pinched for some sizes and grades of drawn wire.

Chicago — A bumper hay crop in the Midwest has accentuated the demand for baling wire and suppliers are unable to even approach meeting the heavy demand. Aluminum ties are being offered by several Midwest fabricators and balers are reported to be buying these at

FOR MIRROR FINISH *Siefen*

BUFFING NU SPRA GLU

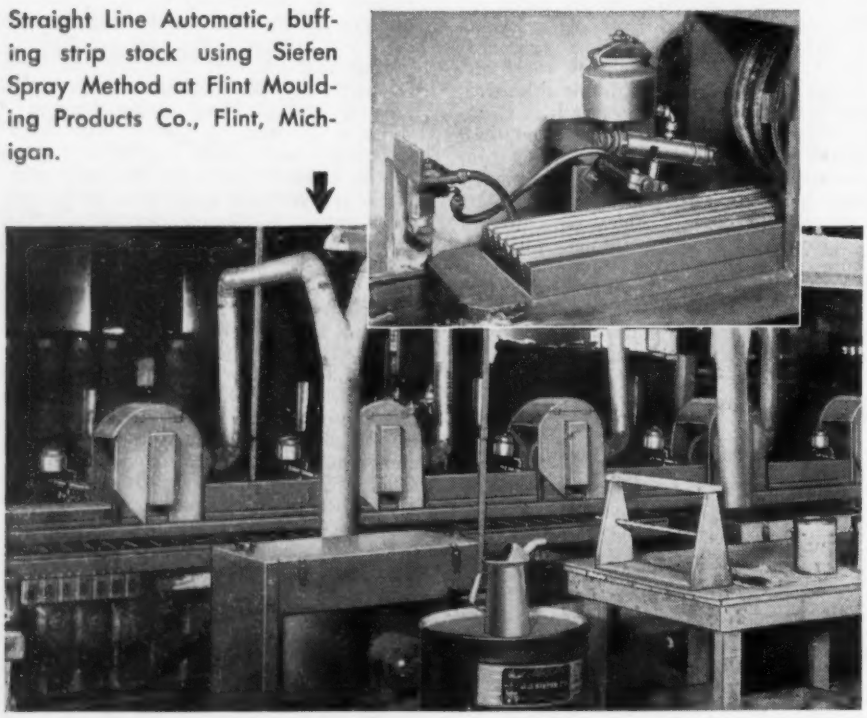
Buffing Nu Spra Glu, a grease and abrasive mixture, sprays to wheel, cuts compound consumption in half and buff wear one third. Available in emulsion or oil-base types.

For satin finish—Nu Spra Glu. A liquid cold glue and abrasive mixture that dries instantly when sprayed on a revolving wheel.

***AND REMEMBER*—NU GLUE**

is a liquid cold glue for setting up polishing wheels.

Straight Line Automatic, buffing strip stock using Siefen Spray Method at Flint Moulding Products Co., Flint, Michigan.



J. J. SIEFEN COMPANY

5625 LAUDERDALE—DETROIT 9, MICH.

prices considerably higher than that for steel ties. Barbed wire, heavy fencing and fence posts are in unprecedented demand, and manufacturers refuse to predict early balancing of supply and demand.

Birmingham — Jobbers report an amazing continuation of the widespread demand for most wire products. Heading the list are nails, wire fencing and processing wire, although major concern of jobbers is fencing and nails, demand for which is expected to remain ahead of available supplies as long as present weather conditions continue.

Plates . . .

Plate Prices, Page 115

New York—Potential plate tonnage is piling up beyond immediate needs for large pipe, increased car building requirements, notably for tank cars, and oil refinery work. Plate mills are back to near capacity production, but lost output earlier this month and raw material problems with some mills indicate a carryover into fourth quarter despite selective booking in weeks past. Tightest are light plates, 3/16 and 1/4-inch; small tank shops and miscellaneous fabricators have been forced to readjust schedules to plate supply. On the other hand, stocks of heavier plate are somewhat better with most shops.

Boston — Inability to locate a plant for the fabrication of pipe for the 20-inch oil line, Portland, Me., to Montreal, has delayed the contract award, the project taking 50,000 tons of plates. Work may be located in a district shipyard. Portland Pipe Line Co. Inc., builders of the line, are unable to purchase 20-inch seamless pipe. Line will parallel a 12-inch carrier now operating and the inquiry for steel is the largest for plates in New England.

In allocating plate tonnage for fourth quarter, carryovers are a factor and in some cases these are likely to be higher on 3/16 and 1/4-inch where some mills are loaded with the bulk of these sizes; others have accepted a minimum of welding quality in light gages. In the heavier quality category, most fabricators have better inventories. With the supply of components improving car shop schedules at Worcester tend higher; shop is making trolley coaches and passenger cars for the New Haven railroad.

Philadelphia — After third quarter carryovers are rescheduled and accumulated tentative orders are assigned rolling space for fourth quarter, there will be little left for new plate volume. Some mills are already filled through this year with car building requirements maintained at high levels and no signs of slackening in that direction this year. Large pipe and refinery needs are also heavy, fabrication of considerable pipe being held back until plates are freer. Miscellaneous industrial needs are also in excess of supply and fabricators in some instances are substituting higher priced grades. There have been small tanks fabricated of floor plates, for instance. Due to high costs one mill is not currently producing high tensile alloy metal.

Cleveland — Demand continues at a surprisingly high level in the plate market here. Some producers have accumulated large carryovers, including those resulting from shutdowns due to vacations and to restricted operations during the coal miners' holiday, and plan to omit quotas for October, using that

month's output to reduce the order backlog.

Birmingham — Although lacking a great deal of the pressure heretofore evident, the plate market continues strong with demand equivalent to or better than output. Considerable backlog tonnage has been worked off in plates, but a substantial volume remains. Car production at Bessemer, now on an expanded schedule, is accounting for a large portion of the plate tonnage. Tank manufacturers and ship building and repairs are also a major factor.

Portland, Oreg. — Several large contracts are on the books of Portland's two important plate fabricating plants. American Pipe & Construction Co., Steel Tank & Pipe Division, reports operations up to capacity, according to H. A. Grubb, vice president Plate supplies are short but this plant has a good backlog of large tank and boiler jobs.

This firm is fabricating 2500 tons for Tacoma's Green river gravity project, 5/16-inch, also has the contract for 3500 tons, 5/16 and 3/8-inch coal tar enamel-lined steel pipe for Seattle's Cedar river water project. Another contract is for Eugene, Oreg., involving 4000 tons of which 2500 tons came from war surplus and 1500 tons were supplied directly by the mills.

Beall Tank & Pipe Corp. is fabricating 1200 tons of 18-inch ¼-inch ply, for Hillsboro, Oreg.; also 1500 tons of 24-inch, 5/16-inch coal tar lined water pipe for Seaside, Oreg., where another 1000-ton project is pending. Hillsboro will call bids in August for an additional five miles of steel pipe.

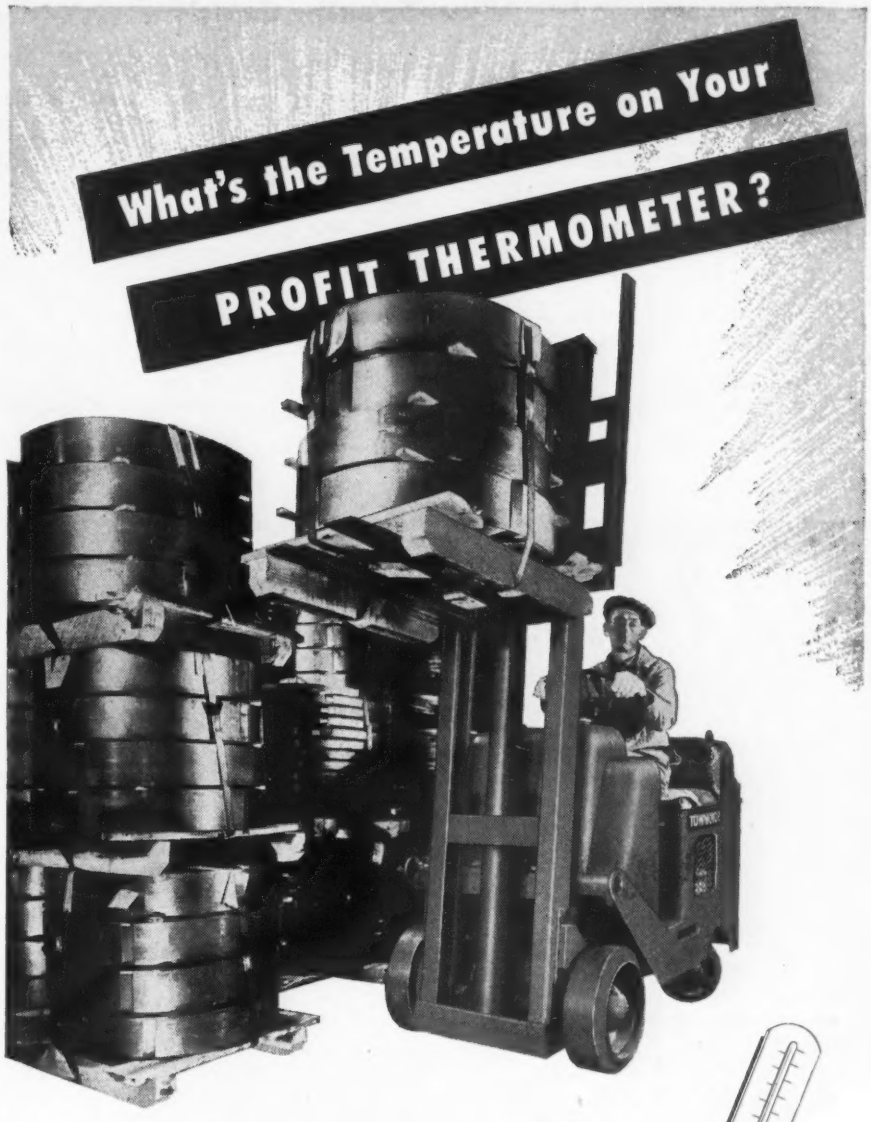
Steel Bars . . .

Bar Prices, Page 114

Boston — While cold-finished carbon bars gradually ease in lower range of sizes no improvement in smaller hot-rolled is apparent and fourth quarter allocations will generally be no heavier. Within reason most cold-drawn stock is not under allocation and recent bidding for an alloy tonnage, Boston Naval shipyard, brought out real mill competition; delivery in 15 days was promised in one tender. Consumer and warehouse inventories of cold-drawn carbon are more generally in balance except for the smaller sizes, but the demand trend for hot-rolled is more difficult to follow. Most users realize nothing is available beyond quotas and, for tonnage beyond that, pressure has slackened as most realize no additional volume is in sight. Flats are also hard to buy.

New York—For fourth quarter some cold-finished bar tonnage is booked and consumers of that grade are getting requirements in a lower range of sizes. Hot-rolled carbon in small sizes will be allocated and not much, if any, additional tonnage will be forthcoming; quotas will be assigned by most mills this week. There is some slackening in forge shop demand, but inventories continue to be out of balance. This inventory situation is most serious with bolt and nut shops. Alloys are easy and producers are seeking tonnage. Some readjustments in extras are considered likely to accompany any price revisions in bars.

Philadelphia — Most sizes of hot-rolled carbon bars are under allocation and in the smaller ranges supply is limited, notably flats. Cold-finished and alloy bar supplies generally balance demand, although wire sizes in the former are still exceptions. Demand for cold-finished



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bars has slackened, primarily due to better balanced inventories in relation to other steel products, notably flat-rolled.

Chicago—Small carbon bars continue extremely scarce, although large sizes and alloy bars continue to become easier. Cold-finished output has been better than expected and these are in fair supply.

Producers have been shipping large quantities of bars to freight car builders to expedite the car building program. In fact, June shipments to car makers were in excess of the voluntary quotas.

Bolt and nut manufacturers are having difficulty in obtaining supplies of small sizes, generally 5/8-inch and under. Demand from farm implement companies, auto partsmakers and a variety of processors and converters shows no signs of diminishing.

Tubular Goods . . .

Tubular Goods Prices, Page 115

Pittsburgh — Seamless and electric welded tubing production schedules have returned to practically capacity among the integrated producers, although shortage of tube rounds continues to slightly restrict output of nonintegrated interests. New orders are somewhat below tonnage value reported earlier this year, reflecting less duplication of ordering and easing in pressure on part of consumers to buy far ahead. New orders for pressure tubing far exceeds the demand for mechanical. No letup in pressure for delivery of line pipe in practically all size classifications is indicated throughout the remainder of this year. Some producers are booked into 1950 for the large diameter line pipe. Standard pipe requirements for miscellaneous plant repairs and new construction continues abnormally large with result that jobbers' stocks continue nearly depleted despite relatively large monthly mill shipments to date this year.

In an effort to offset the critical shortage in steel line pipe supply, extensive experimental work and field tests are under way aiming at the possible substitution of aluminum for steel. It is known that aluminum's resistance to crude petroleum is very good and that mechanical or welded aluminum pipe will stand the necessary pressures. Seamless aluminum tubing has been made up to 12 inches O. D.; welded rolled aluminum plate is used for over 12 inches O. D. pipe, and further study is under way for the possibility of going up to 30 inches. Industry sources state that cost of aluminum pipe normally is prohibitive but that due to the critical shortage of steel pipe today it would afford a badly needed substitute if proven satisfactory in operation.

If and when anticipated price action is taken, the trade expects upward adjustments in base prices; revision in inequities between various base prices; and adjustment in extras (not tied in with base prices) which were not changed earlier this year. Tubing producers contend they are losing money on hot-rolled thin gage seamless tubes, small diameter pressure tubing and most cold-drawn seamless mechanical tubing.

Boston — With one producer closing out on electric welded tubing, some consumers are seeking new sources of supply after fourth quarter. Several shops have added welding equipment but are confronted with lack of sufficient strip for forming. Merchant steel pipe continues among the shortest in supply and some mills will end next quarter at least two months behind schedule. This portends some blanking out for early 1948. Utilities will anticipate earlier 1948 requirements, which will be heavier. This will strain the quota system, as numerous utilities want pipe for the period in one or two quarters. On larger seamless pipe some mills are sold to 1951. Most tubing is also in limited supply, although distributors are getting slightly less demand for mechanical tubing. Demand for pipe from distributors is heavier, but reflects in part buying which normally would be direct with mill.

Cleveland — No improvement in the pipe supply situation has developed here, demand still exceeding supply by a wide margin. As a matter of fact, quotas for the fourth quarter will be cut in most instances by about one-third from those of the current period. This reduction will be made so that producers will be able to reduce the anticipated heavy carryover of orders which has been accumulated, a substantial portion of which is attributed directly to the recent mills shutdowns for vacations and production curtailments caused by the recent shutdown of the coal mines.

Portland, Oreg. — Cast iron pipe agencies here report demand far in excess of supplies, deliveries being based on 400 to 450 days. Pacific States Cast Iron Pipe Co. is furnishing a large tonnage for a housing project at Beaverton, Oreg., while other important awards are pending. Because of conditions in the cast iron pipe market, competing types of pipe have been purchased in some instances where price and delivery are factors The city of Spokane has called bids July 24 for 1250 tons of 6, 8 and 10-inch bell and spigot.

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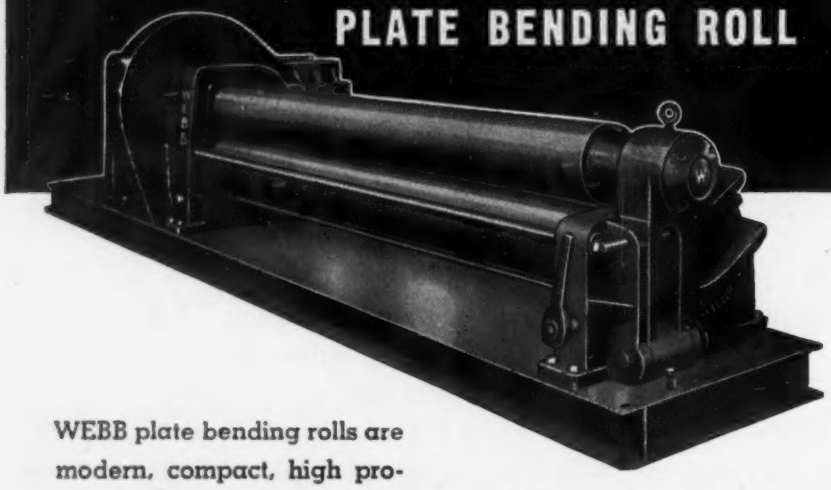

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Tin Plate . . .

Tin Plate Prices, Page 115

Washington — A total of 144,000 tons of tinplate for export in the last quarter of the year was approved by the Tinplate Advisory Committee last week.

The total would comprise 120,000 tons subject to rating, and 22,000 tons to be licensed for export on a non-rated basis. Tin mills would be required to accept orders for rated tinplate, which is earmarked for use in canning foods abroad. If all unrated orders are accepted, 10,000 tons would go to package food products to be shipped to the United States, and 12,000 tons to American oil companies and non-food users abroad, an increase of 2000 tons over third quarter.

The quota for export finally approved was screened from a requested 184,000 tons for food use, and for other essential purposes making a total of 206,000 tons.

Pittsburgh—Extent of huge foreign tin plate demand is indicated by the fact that in the establishment of fourth quarter export load directive of 120,000 tons, plus additional quota of 22,000 tons on an unrated basis, government officials were forced to screen stated essential requirements totaling 206,000 tons. Because of the record-breaking tin plate demand for domestic use, government officials decided it was impossible to license the exporting of such a large tonnage even though it was considered essential.

Although tin plate production was generally unaffected by the recent curtailment in primary steel production resulting from inadequate coal supplies during the miners' vacation, the current carry-over tonnage figure is still estimated at 31,000 tons. It is hoped that the industry's carry-over tonnage as of Sept. 30 will not represent more than 15 per cent of their export load. This means carry-over tonnage will have to be reduced by some 8000 tons this quarter Industry officials are not too optimistic as to whether this can be accomplished for they state shipments will be adversely affected because of the acute shortage of box cars during the grain harvest movement, and anticipate difficulties in arrangements by foreign buyers for letters of credit.

Chicago—With government controls over tin products continued until March, 1948, producers see no chance of an easing in tin mill schedules before next year.

Iron Ore . . .

Iron Ore Prices, Page 116

Cleveland — Consumption of Lake Superior iron ore declined in June to 6,499,882 tons from 6,884,803 tons in May, according to the Lake Superior Iron Ore Association, this city. Consumption in June, 1946, amounted to only 4,994,936 tons. Of last June's total, 6,261,692 tons were used in this country and 238,190 tons in Canada.

This brought the total for the first half of this year to 40,230,652 tons compared with only 24,242,288 tons in the like 1946 period. Strikes in the coal and steel industries a year ago curtailed blast furnace operations.

Total stocks of iron ore on hand amounted to 21,745,798 tons on July 1 compared with 17,618,341 tons on June 1 and 26,264,914 tons a year ago. Stocks on Lake Erie docks in the United States totaled 2,152,103 tons as of July 1 against 2,077,802 tons a month earlier while stocks at domestic and Canadian furnaces totaled 19,593,695 tons and 15,540,539 tons, respectively. Stocks at United States furnaces came to 18,869,689 tons as of July 1 and 14,939,215 tons as of June 1.

At the beginning of July, 150 furnaces were in blast, a drop of 24 during the month, all in the United States, due to closedowns for vacations and as a fuel conservation measure during the miners' holiday. Eight blast furnaces remained in blast in Canada. The number of idle furnaces was 41 as of July 1 against 17 as of June 1 in the United States while two remained idle in Canada. A sharp recovery has been recorded so far this month in blast furnace operations in this country.

Metallurgical Coke . . .

Metallurgical Coke Prices, Page 116

Chicago—Foundry coke prices at Chicago have advanced $1.40 a ton to compensate for higher costs resulting from the coal wage settlement. The latest increase follows a $1 advance of two weeks ago. Coke now is quoted $17.50 outside Chicago and $18.50 delivered in Chicago. Comparable increases have been made or are being planned at nearby centers.

Cincinnati—Another increase in quotations on oven foundry coke appears imminent, although the price was boosted $1.11 immediately prior to the coal miners' wage settlement. Ovens maintained production during the holidays.

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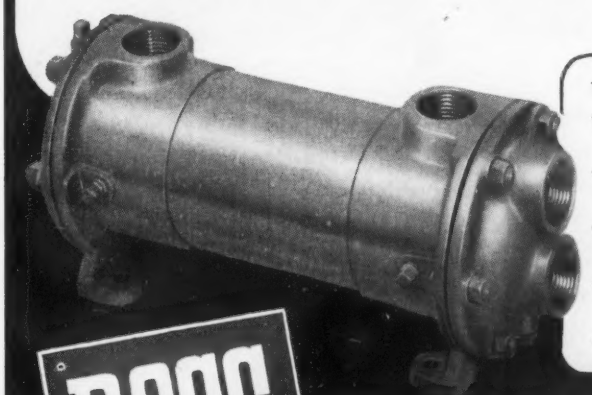

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Structural Shapes . . .

Structural Shape Prices, Page 115

Philadelphia — To make possible the degree to which they may estimate and quote on a fairly substantial inquiry, fabricating shops are pressing for fourth quarter tonnage allocations which are expected this week. Not much, if any, increase in quotas is looked for with spot openings for the balance of this year uncertain. A substantial volume of special shapes is going to car builders. One eastern fabricating shop has returned to escalator clause applying to material only after a brief period of quoting firm prices to cover expected advances in plain material.

Cleveland — Structural shape mills are booked well ahead with substantial business awaiting openings. Some producers will eliminate October quotas in an effort to bring shipments up to a current schedule basis.

New York—Excluding public works, bulk of structural steel order backlog is covered by escalator clause contracts; for most private construction and engineering work, earlier contracts without this clause have been completed. Firm bids are required on federal-aid public work but most other tenders still include the escalator arrangement. With the car building program taking heavier tonnage, plain material will remain tight through fourth quarter.

Boston — Structural steel fabricators and warehouses will get fourth quarter allotments this week after considerable earlier pressure for the opening of books. The latter development has been delayed until mills are able to establish their position more definitely. Although demand for structural material is heavy, pressure in terms of tonnage is slightly easier in view of slackening inquiry for fabricated steel. Bridge tonnage is mostly under contract for this year, only a few hundred tons in beam spans likely to come out. District shops have backlogs for fabricated steel ranging to three months; one at Cambridge is an exception with heavier bookings.

Chicago—Midwestern structural shops are receiving lots of inquiries for work in Iowa-Nebraska flood area, to replace bridges and other structures damaged by high waters. This is expected to increase as the flooded regions complete surveys of damage and requirements for reconstruction.

Birmingham — Shape production is substantial but hardly up to recent months. Demand is still described as spotty. Contemplated highway construction is expected to exert considerable influence on shapes. Construction, on the whole, is slowed down measurably due to the price and material situation, with a corresponding effect on shapes.

Portand, Oreg. — Conditions in Oregon are similar to those in other Pacific Northwest areas. Construction is active, steel plants are busy, but lack of supplies is hampering operations. The potential market for steel products is of large proportions, but many projects are being delayed until definite and quicker deliveries of materials can be expected.

Oregon Steel Mills, fabricating merchant bars exclusively, reports that its furnaces cannot produce sufficient ingots to meet the enlarged capacity of the mill, which consequently is rolling only 3½ to 4 days weekly. It is serving the domestic trade, taking no export business. An imposing order backlog is being reduced gradually. Scrap continues scarce, the price holding steady at $20, fob mill. Inventories are low.

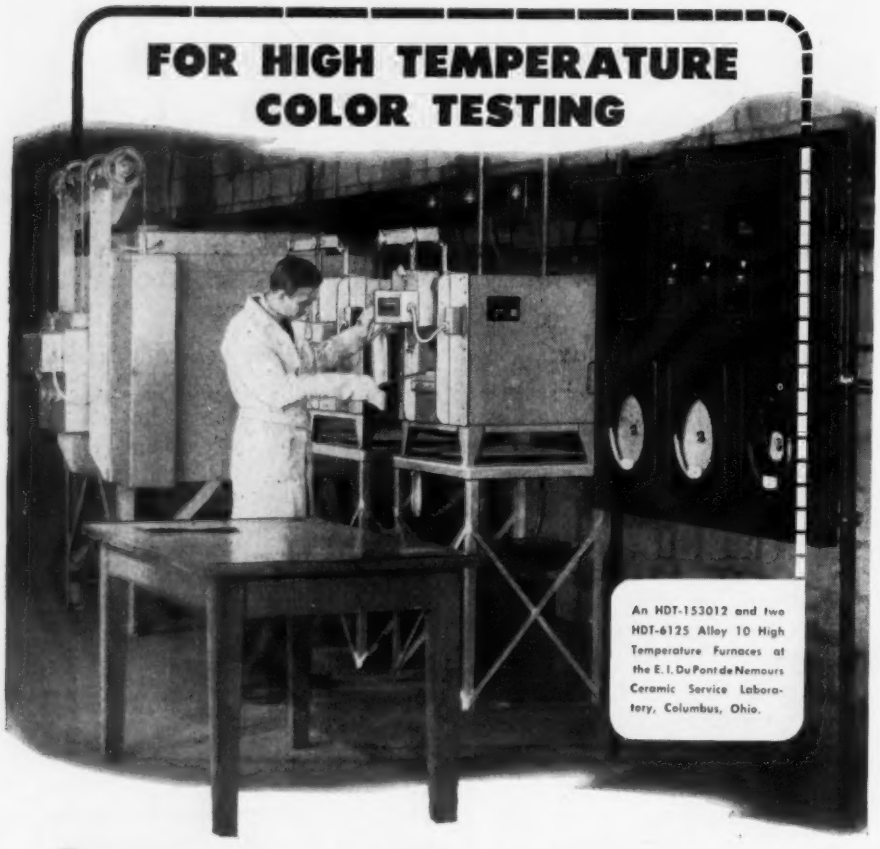
Fabricators here report only a fair volume of new work, but they are seriously handicapped by lack of steel. Orders are being forwarded, but deliveries are frequently delayed and indefinite. New business consists almost entirely of small tonnages, few large projects pending.

Bonneville Power Administration has awarded 8115 tons of shapes involved in transmission towers to Bethlehem Pacific Coast Steel Co. and 155 tons of shapes to the same producer for substations. These contracts are based to some extent on funds available, Bonneville awaiting information regarding appropriations.

Pig Iron . . .

Pig Iron Prices, Page 116

Pittsburgh—All merchant pig iron interests in this area raised prices $3 a ton on all grades by the weekend to offset increased labor rates of last spring and recent advance in soft coal mining costs which have resulted in a substantial increase in coke and pig iron production costs. The Neville Island, Pa., base price for No. 2 foundry and malleable iron is $36.50 per gross ton; basic, $36; and bessemer, $37. The price advance in this area was initiated by Pittsburgh Coke & Chemical Co. on July 16, followed on July 18 by Shenango Furnace Co. at the Sharpsville, Pa., base and on July 27 by the United States Steel Corp. at its various selling points, including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Boston — Advancing pig iron prices $3 a ton for all grades by the Bethlehem, Pa., producer will have no immediate effect on users of Mystic tonnage, pegged at $45 furnace for foundry grades during the first year of the mutual agreements; after one year the Everett price is tied into the Buffalo price at a $5 higher limit. Although shipments from Bethlehem and Buffalo are far below normal, some tonnage is involved pricewise as iron costs increase with indications that eventually, or when supply is freer, price will be a prominent factor in this area. Due to the shortage of iron, ratio of scrap in melts continues abnormally high, 80-85 per cent in some instances, although the larger consumers, textile mill equipment builders included, maintain a ratio of scrap to pig nearer to 60-40 per cent. There is a strong demand for iron and any improvement in supply, not yet in sight with steel works operating near capacity, will show in higher ratio of iron in melt mixtures.

New York—Pig iron prices advanced from $3 to $3.50 a ton, the lower increase applying to Buffalo and Bethlehem, Pa., tonnages and the latter to southern Swedeland, Pa., tonnages.

Shortages of iron have reached the acute stage with some consumers; inventories are low with prospects of an increase in supply of merchant iron slim. Abnormally high ratio of scrap in melt mixtures is widespread. Some melters have already exhausted July iron, although total melt for the month will be down slightly because of vacation suspensions. To expedite shipments in scattered instances furnaces are shipping cars with lots under 50 tons.

Philadelphia — Bulk of iron for this district consumption is $3 ton higher, although the Swedeland, Pa., and Troy, N. Y., furnace advance was $3.50. Earlier the Birdsboro furnace raised prices $6. Southern foundry iron, sold on a Bethlehem base here with the 38-cent differential, is $38.84, delivered Philadelphia. Consumer inventories are small with no early improvement in tonnage expected as merchant furnaces are supplying their limit and spreading distribution thin. One car, 50 tons, frequently includes two deliveries of 25 tons each.

Buffalo—All producers joined in price increases of $3 a ton for pig iron in this area. This boosted No. 2 foundry to $36; basic, $35.50; bessemer, $37; and malleable to $36.50. Merchant sellers continue to quote on the basis of fob cars at Buffalo furnaces for consumers in the New England and midstate areas.

Lack of oven foundry coke became a serious problem for many melters in the western New York and downstate areas. Increased quantities of Pennsylvania beehive coke were being used. The coke shortage was reflected in some of the pressure being lifted on demand for pig iron. While the iron situation has eased, producers have no trouble disposing of current output.

Chicago—Pig iron prices have been advanced $3 across the board, raising No. 2 foundry iron to $36, Chicago, base. Southern iron, recently increased $3.50 a ton at Birmingham, is quoted $3 higher at northeren basing points. Pig iron output in the district will be increased as result of resumption of three blast furnaces of Wisconsin Steel Division of International Harvester Co. following settlement of a strike. Thirty-eight of the district's 41 stacks now are in operation. Foundries are facing increased material costs all along the line, with sharp increases in scrap, pig iron and coke.

Cincinnati—Shipments of pig iron into this district are approaching the normal level established prior to furnace curtailments due to coal shortage. It is probable that July allotments will not be met in full. The price increases were anticipated, and hence put into effect without comment. Pressure for deliveries appeared weaker, probably due to the light melt during vacation periods.

Birmingham — Pig iron buying goes on apace despite recent price increases, which means that demand continue in excess of available supplies. A boost of $3.50 a ton, announced recently by Sloss-Sheffield Steel & Iron Co. and Republic Steel Corp., has been followed by Woodward Iron Co.

Scrap . . .

Scrap Prices, Page 120

Chicago—Heavy melting steel has advanced $5.50 a ton to $39.50 and electric furnace grades have moved up to $42. Both No. 1 and No. 2 melting steel and No. 2 bundles now are selling at the top price and the differential between dealer and industrial scrap no longer is being observed.

Supply continues short and the market is strong. Dealers report some sales at above the established prices. Malleable and railroad scrap figure prominently in the premium price sales.

Dealers are not too optimistic that the higher prices will bring out an ap-

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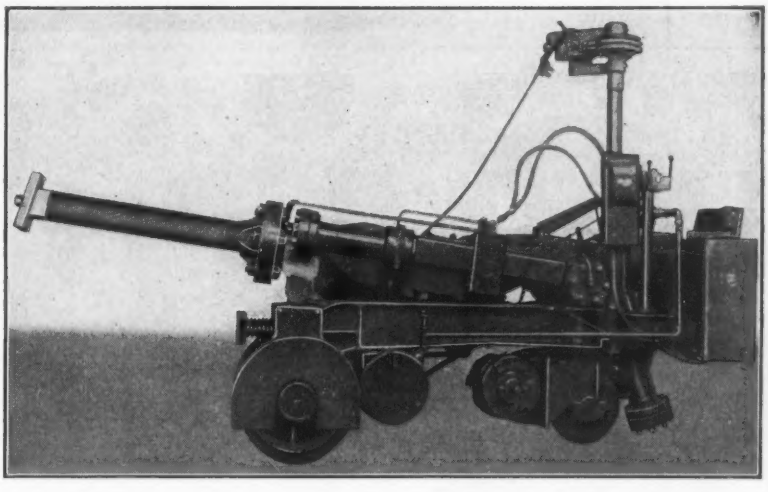

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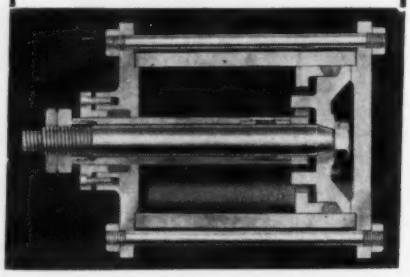

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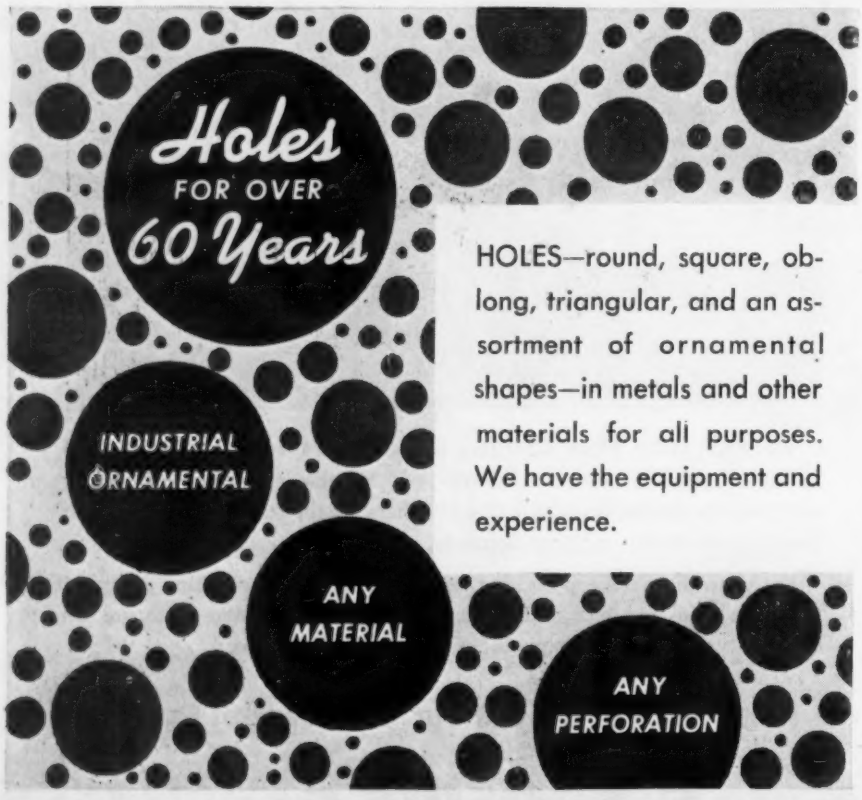

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Pittsburgh — Although leading consumers contend they are out of the market, unconfirmed reports indicate that at least two sales of substantial tonnages occurred last week within the $38 to $39 price range for local heavy melting steel. On deals involving remote scrap, prices as high as $42.50 were reported. The latest acknowledged sale, however, was at $36, but this same interest admits purchase at this level is no longer possible. Brokers are paying around $37 to $38 for open-hearth grades, part of which tonnage is to cover old orders and they contend they would not accept a large tonnage for local material under $40, despite the restraining influence on large tonnage reciprocity scrap deals. A stronger market is developing throughout the entire scrap list with turnings up 50 cents to $1 and low phos grades, $1 to $1.50.

Higher pig iron prices are expected to result in stronger cast scrap quotations. No. 1 cupola and heavy breakable cast grades already have advanced 50 cents or more. Some railroad heavy melting steel scrap recently was awarded at above $40. A substantial tonnage of industrial scrap is reported to be coming to this district from Detroit at around the $38 level on a reciprocity basis.

Philadelphia — Although steel works inventories are generally limited, new buying at rising prices is not heavy and strength of firm market is largely predicated on broker bids to cover against old orders. For the latter tonnage, mills are pressing for delivery. Most scrap grades are $1 to $2 higher but the increase in malleable is greater, sales having been made at $57. Volume of scrap reaching yards is not substantially heavier and tonnage is affected by the lack of automobile wrecking. Some increase in industrial scrap is expected to develop next month.

New York — Rise in open-hearth steel scrap prices is less feverish, heavy melting, bundles and busheling advancing 25 to 50 cents a ton while turnings and other grades hold near recent levels. Buying is largely by brokers against old orders as mills, some with low inventories, press for delivery against previous commitments. New mill buying is not heavy at higher prices, consumers holding off on the rising market unless material is currently needed to maintain operations. Some have reached the point, however, where increase in new buying is not far distant.

Boston—Further advances in the price of open-hearth steel scrap were registered here last week without the support of new mill buying in volume. A substantial part of the market's strength is apparently due to broker-covering against old orders. When the price for heavy melting steel reached $34, shipping point, there had been no buying for eastern Pennsylvania or Pittsburgh to represent a corresponding delivered price. Open-hearth steel scrap is approaching the postwar peak of last March when the rise halted at $36 in this district. Turnings are more reluctant in following heavy melting steel in the last advance. No. 1 cupola cast is firm and active for district consumption but other cast grades are supported chiefly by outside buying.

Buffalo—Fears of abnormal price increases and tension over competitive bidding with other areas for limited supplies gripped the scrap market last week. Sales at prices at least $2 a ton

higher than recently-advanced ranges were expected momentarily. Dealers were reported turning down bids of $40 for No. 2 heavy melting and bundles, even though the quoted nominal price is $38, which was up $4 from the previous figure when it was established in the preceding week.

No. 1 heavy melting is quoted separately as a sale was reported at $41.50. Brokers are skeptical of accepting tonnage orders as Pittsburgh buyers are reported in the area ready to equal any price paid by brokers or even go the brokers' price one better.

Sales were reported here which run $42 to $43 at Pittsburgh with freight charges included. Active bidding by mills is reported as the volume of scrap moving is comparatively light. Most consumers are just about holding their own. Efforts to build up reserves for the winter are generally futile. A 3000 ton boatload of borings arrived from Detroit. Boat scrap, however, is also lagging.

Cleveland — Scrap prices held unchanged here last week as leading mills remained out of the market. Receipts on old contracts are sufficient to maintain fair stocks. Large tonnages are being diverted from this district to the Mahoning Valley where need for additional supplies is more pressing. Demand for foundry grades remains heavy here.

Cincinnati — Scrap prices moved upward $1 again last week, to reflect the strong undertone of the market rather than a test in recent tonnage buying. Brokers and dealers admit that they are uncertain as to the price level, in the unstable market. Advances in the price of pig iron were a contributing factor in the current scrap increases. Material has been coming out in fair volume, with hesitancy shown in production scrap due to vacations this month.

Birmingham — The district's scrap market went "haywire" again last week. Brokers declare there is no way of accurately forecasting what will happen. A matter of record, however, is the fact that price boosts from $1.50 to $3 a ton were added. At that, scrap was reported virtually unobtainable. Scrap has gone in hiding, it is reported here, in anticipation of still further increases.

St. Louis—This district fell in line last week with the eastern scrap price trend when prices climbed $3 to $5 a ton. Scrap scarcity is becoming acute and mills complain that quality is so bad as to interfere with production. Reserve scrap supplies are equivalent to 30 days' needs, or under.

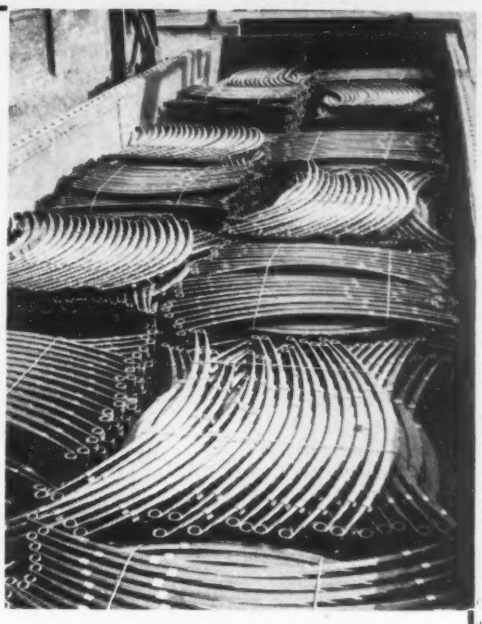
Rails, Cars . . .

Track Material Prices, Page 115

Pittsburgh—Freight car construction continues to lag behind projected assembly schedules and there is little prospect the 10,000 car monthly goal will be reached until late this year. However, industry officials are hopeful that the original goal of 7000 cars monthly will be attained during August, and there is some possibility that July output may even approach this figure. Freight car builders' assembly schedules are restricted by unbalanced steel inventories, notably plates and sheets. They contend it is impossible to step up assembly schedules until adequate steel and components are on hand to assure uninterrupted operations.

AS SIMPLE AS A-B-C

Gerrard Galvanized Round Steel Strapping is Reinforcement SIMPLICITY. Gerrard Round Steel Strapping is its own reinforcement, the Gerrard Tie being an integral part of the strapping itself. There are no seals and no crimping to fool with, thus bringing strapping labor to a mere tensioning and twisting of the Gerrard Straps.



Car of Automobile Springs in Unit Bundles of approx. 4000 lbs. reinforced by Gerrard Round Steel Strapping.

The Gerrard Method is used throughout the country on all types of carloading stowage, on wood boxes of heavy metal parts, on bundles of lead and aluminum pigs, on export tinplate, sheets and miscellaneous steel bundles. Just as it is simple, so is it universal. Gerrard Strapping's ability to withstand transportation shocks is due to its ductility and its high tensile strength, and it "DELIVERS THE GOODS."

It costs 30% to 55% less than any other metal reinforcement on the market and we can prove it.

Write for our free BLUE BOOK of PACKAGING, and the RED BOOK of CARLOAD STOWAGE and note that Gerrard engineers are available at no obligation to you.

GERRARD STEEL STRAPPING COMPANY

4745 SOUTH RICHMOND ST. (formerly The Gerrard Company Inc.) CHICAGO

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BEVERLY THROATLESS SHEAR

● Handles intricate cuts easily. No distortion. Unusually strong and durable, geared to give great power with little effort. Metal can turn any direction while cutting.

● Machines available for 14 ga., 10 ga., and 3/16 in. material.

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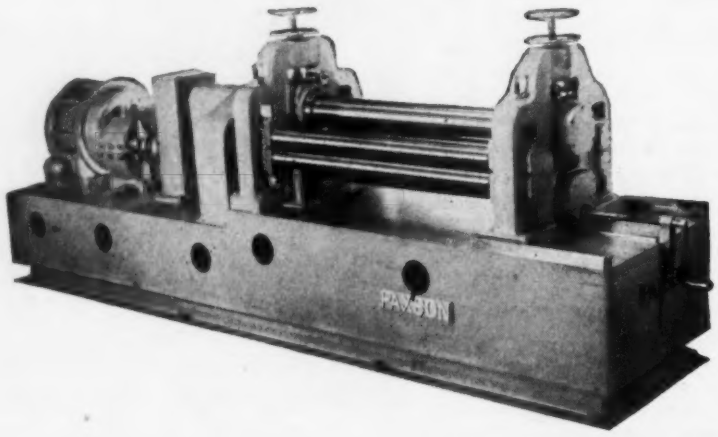
If you slit *either* SHEETS or COILS



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BUILDERS OF COMPLETE SLITTING LINES

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SALEM, OHIO

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to Close Tolerances

As a result of its wartime activities in manufacturing gun parts, which brought the Army-Navy Award with three stars, the Hendrick plant now has surplus facilities available for making small to medium size precision products to close tolerances. In fact, it is common procedure for Hendrick's experienced machine tool operators to work to a tolerance of .0005 inches.

If you will submit specifications and samples of products on which you wish quantity prices, we will quote promptly.

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Manufacturing Company

30 DUNDAFF STREET, CARBONDALE, PENNA.

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Perforated Metals
Perforated Metal Screens
Architectural Grilles
Mitco Open Steel Flooring,
"Shur-Site" Treads and
Armorgrids

Although axles and car wheels are in somewhat better supply position, it is believed that cast iron wheels will have to be used to help meet the freight car assembly schedules over the coming months. Recent interruption in the production of plates, bars and rails, due to curtailment in primary steel production resulting from inadequate coal stocks during the coal miners' vacation period. has accentuated the over-all steel supply situation for the railroad car program.

If and when steel prices are adjusted, railroad car interests expect an advance of $3 to $5 in the base price on railroad steel items, and there is some possibility that extras will also be revised because of the increase in labor cost to date this year.

Chicago—Shipments of steel for the car building program by Chicago producers is ahead of schedule on all items, including shapes, bars, plates, galvanized and hot-rolled sheets. Mills are unable to understand why the program is lagging, but point out that production of cars for export exceeded cars for domestic use in the first six months of this year. Car builders now are aiming at September to reach their goal of 10,000 cars monthly.

Warehouse . . .

Warehouse Prices, Page 117

Pittsburgh—Distributors believe steel supply outlook should gradually improve over the remainder of this year, with the possible exception of sheets and scrap. Reflecting this trend, most warehouse interests expect their inventories to be much better balanced by the fourth quarter. Temporary curtailment in primary and finished steel output during the miners' coal vacation period has accentuated the shortage of steel items from warehouse sources. Most distributors' stocks of light gage sheets, plates, small-sized carbon bars and most structural steel items are nearly depleted, while those of cold-finished and alloy steel products are in much closer balance with demand. Distributors are still under heavy pressure for deliveries, although this situation is not as acute as earlier this year.

Friction saw cutting extras for structural items under 5 feet long (no extra charge for over 5 feet) have been revised as follows:

A minimum extra of 50 cents is now charged against 35 cents previously. Under 10 pounds per lineal foot, the extra is 10 cents against 7 cents formerly; over 10 pounds to under 17.5 pounds, 15 cents, against 10 cents; 17.5 to under 30 pounds 30 cents against 15 cents; 30 pounds to under 45 pounds, 45 cents, against 20 cents; 45 to under 65 pounds 50 cents, against 25 cents; 65 to under 90 pounds, 75 cents against 30 cents; 90 pounds and over, the new extra is 9 cents, compared with 35 cents.

New York—For the short-supply hot-rolled carbon products, inquiry is heavy and individually large from consumers unable to buy direct from mills. Warehouse inventories are in no shape to meet this demand and but a fraction of the tonnage wanted is being sold. In this category are pipe, plates, structurals, small bars, flat-rolled in all grades except stainless, and most wire products. Cold-finished bar items and alloys are in stock on most wanted sizes to meet a demand which has slackened more than for the above named. Prospects

FLAT or COILED ... FORMED or STAMPED

Special Finishes, too!

SPRINGS
WIRE FORMS
SMALL STAMPINGS

No matter how unusual . . . or intricate . . . your spring shape may be, Raymond has the experience and equipment to make it. Expert advice on materials and finishes for a wide range of uses is one extra dividend that insures dependable performance. Check your specifications with Raymond for safety and economy . . . in any quantity.

RAYMOND SPRINGS

RAYMOND MANUFACTURING CO. CORRY, PENN.
DIVISION OF ASSOCIATED SPRING CORPORATION

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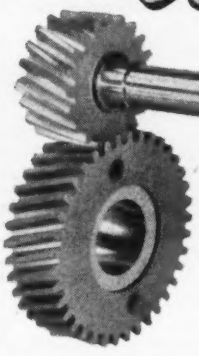

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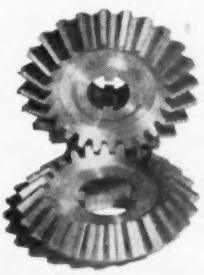
HELICAL and BEVEL GEARS—From 1" to 60" in diameter and from 24 DP to 1½ DP.
SPUR GEARS—Size range from ¾" to 150" in diameter. 32 DP to ¾ DP.
HERRINGBONE GEARS—Made from 1" to 60" in diameter and from 10 DP to 1½ DP.
SPIRAL BEVEL GEARS—Made from 1" to 30" in diam. and 24 DP to 1½ DP.
WORM GEARS—Made from 1" to 100" in diam. and from 24 DP to 1 DP.



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After five weeks treatment with Morco-Thiazole. Note new skin and absence of infection and contractures.

Morco-Thiazole provides immediate relief from pain, controls infection and regenerates burned tissue with minimum scarring. This outstanding burn preparation, used in thousands of hospitals and industrial plants, contains sulfathiazole 5% to inhibit infection, cod liver 65% to stimulate natural tissue growth, phenol, benzocaine and other ingredients well known for their medicinal qualities.

Morco-Thiazole is recognized by leading hospitals and physicians, and is absolutely guaranteed.

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ARCHER-TAYLOR COMPANY MAIN AT PINE STREET WICHITA 5, KANSAS

Gentlemen: Please send us immediately:
☐ Free trial offer of Morco-Thiazole.

Send us, on a money-back guarantee of satisfaction:
☐ 1 lb. jar, $3.50 ☐ 5 lb. jar, $15.75

Terms: 2%, 10 days — net 30 days. Ship C. O. D.

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Hotel Cleveland

CLEVELAND, OHIO

for more steel from mills in the critical products next quarter are dim.

Chicago—The larger warehouses handling a full line of steel products are building up fairly comfortable inventories in a few products, notably large bars, 3 inches and over, some structurals, alloys steels and stainless. All flat-rolled items continue extremely scarce, with stocks moving out almost as soon as received. Distributors say they could do 50 to 100 per cent more business if they could obtain steel. Many orders are being refused or customers are being offered substitutes. Prices continue firm, with no changes anticipated before mid-August.

Cincinnati—Volume of steel shipments from warehouse is being maintained this month at the expense of inventories, in the face of reduced mill replacements in scarce items. Improvement is shown, however, in cold-rolled steel. Expectation of price boosts, based on predictions of mill increases, brought a modest bulge in inquiries.

Canada . . .

Toronto, Ont. — Iron and steel production schedules in Canada are tapering off as a result of holidays which are cutting into work crews at the various steel plants. The greatest effect, however, is in the finishing mills, and it is expected that deliveries to consumers over the next two months will fall well below the high average that has been maintained throughout most of this year. Curtailed output also will delay the time when domestic production will equalize demand for various lines of finished steel.

While steel production is down, industrial operations as a whole have been reduced due to holidays, and new orders placed by consuming interests also have tapered off. Fresh buying is being maintained at a steady rate, but lacks any special interest. Consumers are taking all steel available under the quota system, and it is reported that mills could dispose of twice as much as they are now producing. Shortages continue to be reported in a number of items in the steel list and there have been substantial increases in importations from the United States to meet demand.

Demand for steel sheets is running well ahead of producion and mills are maintaining output to the limit of their capacity, insofar as raw material and labor supply is concerned. Mills are fully booked on sheets to the end of September and have withdrawn from the market.

Expanding demand for steel plate is reported and with only one mill producing plate, many consumers have been turning to the United States for more speedy delivery. Domestic plate mills are booked over the next two months and producers are endeavoring to hold their commitments on delivery to 60-day periods.

Carbon bars are in brisk demand and new orders are reaching the market in a steady flow with all available capacity now filled to the end of third quarter. Alloy bars also have steady call but production is running somewhat ahead of domestic requirements.

Merchant pig iron sales have slowed down as a result of the holiday season, with orders for the week around 5000 tons. However, there has been only minor decline in foundry melting operations and the slump in sales is chiefly credited to the fact that most melters have iron stocks on hand, and available supply is not sufficient to permit any large stock piling either by producers or consumers.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

8115 tons, transmission towers for Bonneville Power Adm., to Bethlehem Pacific Coast Steel Co.

2750 tons, state highway bridge, Luzerne county, Pennsylvania, to Bethlehem Steel Co., Bethlehem, Pa.

2500 tons, elevated highway section, New York, to Bethlehem Steel Co., Bethlehem, Pa.; Lynn Construction Co., New York, general contractor.

1745 tons, bridge over Missouri River at Decatur, Nebr., to Bethlehem Steel Co., Bethlehem, Pa.

600 tons, mill and calcine building, National Gypsum Co., Clarence Center, N. Y., to Ernst Iron Works Inc., Buffalo; Siegfried Construction Co., Buffalo, general contractor.

550 tons, manufacturing building, Hartford Machine Screw Co., Hartford, Conn., to Bethlehem Steel Co., Bethlehem, Pa.; Industrial Construction Co., Hartford, general contractor.

500 tons, rock storage building, National Gypsum Co., Clarence Center, N. Y., to Ernst Iron Works Inc., Buffalo; Siegfried Construction Co., Buffalo, general contractor.

200 tons, warehouse addition, York Corp., York, Pa., to Bethlehem Steel Co., Bethlehem, Pa.

165 tons, addition to library, Duke University, Durham, N. C., to Bethlehem Steel Co., Bethlehem, Pa.

155 tons, power substations for Bonneville Power Administration, to Bethlehem Pacific Coast Steel Co.

110 tons, state bridge repairs, Bradford county, Pennsylvania, to Pine Iron Works Co., Pine Forge, Pa.

100 tons, state bridges, Vermont, to Bethlehem Steel Co., Bethlehem, Pa.

Unstated, new engineering school building, University of Buffalo, Buffalo; John W. Cowper Co., Buffalo, contractor.

STRUCTURAL STEEL PENDING

7500 tons, Lillian Wald housing project, New York; rebid Aug. 12.

2625 tons, steel sheet piling, including 125 tons T piling; bids Aug. 11, U. S. engineer, Buffalo, N. Y., deliver Mt. Morris, N. Y., inv. 4.

1200 tons, Clearwater river bridge, Lewiston, Idaho, new bids in near future; original bidder Paul Jarvis, Seattle, low, $955,167.

1000 tons, addition to Du Pont plant, Sabean River Works, Orange, Tex.

600 tons, including 50 tons reinforcing bars, pumps, trashracks, penstocks, etc., Roza project, Washington; John King & Co., Yakima, low, $108,051.

550 tons, seven-span-I-beam bridge, Lowville-Carthage, Jefferson county, New York; bids Aug. 6 to Albany.

550 tons, power plant, Beaumont, Tex.; Stone & Webster Engineering Corp., Boston; bids in.

500 tons, building addition, Blue Ribbon brewery, Milwaukee; Stone & Webster Engineering Corp., Boston, general contractor.

300 tons, garage, Boston Elevated railroad, Boston.

200 tons, store building, Stop & Shop Co., Cambridge, Mass.

100 tons, twin I-beam bridge, Ontario County, New York, bids Aug. 6 to Albany.

REINFORCING BARS . . .

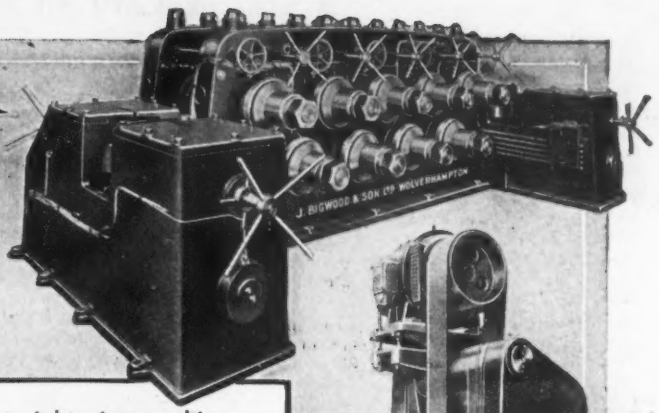
REINFORCING BARS PLACED

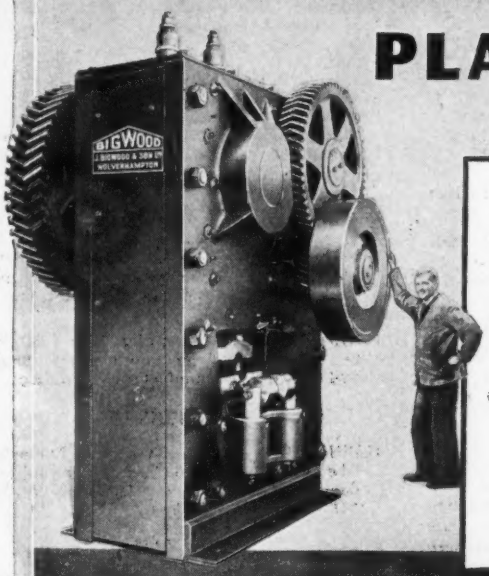
750 tons, Oregonian newspaper plant, Portland, Oreg., to Mercer Steel Co., Portland.

150 tons, engineering building, Oregon State

BIGWOOD

STEEL WORKS PLANT





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THE SUTTON ENGINEERING CO.
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manufacture these machines under licence and all enquiries from the United States of America and Canada should be addressed to them.

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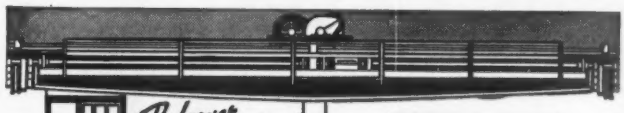
INDUSTRIAL TRUCKS AND TRAILERS

Caster and Fifth Wheel Types

THE OHIO GALVANIZING & MFG. CO.
Penn St., Niles, Ohio



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The OHIO LOCOMOTIVE CRANE Co. BUCYRUS, OHIO

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TIN PLATE

COP-R-LOY PIPE-SHEETS

Ductilite
THE MODERN TIN PLATE

WHEELING STEEL

College, Corvallis, to Soule Steel Co., Portland.

REINFORCING BARS PENDING

1000 plus, five units, University of Washington, Seattle; bids to Board of Regents, Aug. 21.

275 tons, bridges, Edgewood borough, Allegheny county, Pennsylvania; bids Aug. 8 to Harrisburg; also, large tonnage of steel beams, piles and sheet piling.

200 tons, overpass, Edgewood-Forest Hills, Allegheny county, Pennsylvania; bids to Harrisburg.

Unstated, 130-foot bridge Powell county, and 75-foot span Meagher county, Mont.; bids to Helena July 24.

Unstated, auxiliary outlet sewers, Paulina St. system, Cont. No. 1, Department of Public Works, Chicago; bids July 29.

PLATES . . .

PLATES PLACED

4000 tons, water pipe project Eugene, Oreg., to American Pipe & Construction Co., Steel Tank & Pipe Division, Portland.

3500 tons, 66 inch, welded steel coal tar enamel lined, water pipe for Seattle, to American Pipe & Construction Co., Steel Tank & Pipe Division, Portland; Valley Construction Co., Seattle, general contractor, low, $1,011,530.

2500 tons, Tacoma Green river gravity line, to American Pipe & Construction Co., Steel Tank & Pipe Division, Portland.

1500 tons, 24-inch water pipe for Seaside, Oreg., to Beall Pipe & Tank Co., Portland.

1200 tons, 18-inch water pipe for Hillsboro, Oreg., to Beall Pipe & Tank Co., Portland, Oreg.

PLATES PENDING

1000 plus, 20 and 24-inch welded steel water pipe, total 21,000 feet; bids in at Seaside, Oreg.

600 tons or more, five miles 18 inch steel water pipe, Hillsboro, Oreg.; bids probably in August.

PIPE . . .

CAST IRON PIPE PENDING

1250 tons, 6, 8 and 10-inch bell and spigot; bids to Spokane, Wash., July 24.

RAILS, CARS . . .

RAILROAD CARS PLACED

Baltimore & Ohio, 1500 seventy-ton hoppers to Pullman-Standard Car & Mfg. Co., New York; 1000 fifty-ton hoppers to Bethlehem Steel Co., Bethlehem, Pa., and 500 seventy-ton covered hopper type cement cars to Greenville Car & Mfg. Co., Greenville, Pa.; making 11,500 cars on order.

Chicago & Eastern Illinois, 300 hoppers, to American Car & Foundry Co., New York.

Chicago, Milwaukee, St. Paul & Pacific, 250 seventy-ton covered hoppers, to General American Transportation Corp., Chicago.

Detroit & Toledo Shore Line, 100 seventy-ton covered hoppers, to General American Transportation Corp., Chicago.

Elgin, Joliet & Eastern, 1000 cars, including 500 fifty-ton box cars to Magor Car Corp., Clinton, N. J.; 400 forty-eight ft gondolas to Greenville Steel Car Co., Greenville, Pa.

Illinois Central, 3000 cars, including 1500 fifty-ton hoppers and 1500 box cars, own shops in first half of 1948.

Union Tank Car Co., 2000 tank cars to American Car & Foundry Co., New York.

Wheeling & Lake Erie, 1000 seventy-ton all-steel hoppers to Ralston Steel Car Co., Columbus, O.

RAILROAD CARS PENDING

Norfolk & Southern, 250 fifty-ton box cars.

BUSSES PLACED

Seattle Transit Commission, 100 41-passenger motor coaches, to Twin Coach Corp., Kent, O.; first deliveries November, balance first quarter 1948.

CONSTRUCTION AND ENTERPRISE

GEORGIA

ATLANTA—Alston-Lucas Paint Co. has let a $90,000 contract to Southern Concrete Products Co., 1008 Chattahoochee Ave., for the first unit of a paint manufacturing plant.

ATLANTA—Fairbanks-Morse Co., 600 Michigan Ave., Chicago, has let a $150.000 contract to Southeastern Engineering Corp., 469 Peachtree Hills Ave., for construction of an office and warehouse. Architects are A. Epstein & Sons Inc., 2011 Pershing Rd., Chicago.

BUFORD, GA.—Bona Allen Inc., c/o H. J. Jordan, architect, 214 Healey Bldg., Atlanta, has awarded an $80,000 contract to Southeastern Construction Co., Charlotte, N. C., for the erection of a plant here.

EAST POINT, GA.—Southern Saw Works Inc. will build a $250,000 plant addition.

ROME, GA.—Anchor Rome Mills Inc., E. 12th St., has awarded a $100,000 contract to Rome Concrete and Construction Co. for the erection of a mill addition.

KENTUCKY

LOUISVILLE, KY.—Cochran Foil Co., 1403 S. 13th St., will build a $205,000 plant addition.

MISSOURI

ST. LOUIS—Texas Co., 332 S. Michigan Ave., Chicago, has awarded a $200 000 contract to G. I. Tarlton Contracting Co., 5505 Dale Ave., for a 1-story, 92 x 172-ft warehouse at the foot of Gasconade St.

ST. LOUIS—Thrift Hardware & Supply Co., 4558 Easton Ave., has awarded a $250,000 contract to I. E. Millstone Construction Co., 4343 Clayton Ave., for erection of a 1-story warehouse to include railorad siding and loading facilities.

NEBRASKA

BELLEVUE, NEBR.—Farm Fertilizers Inc., Redick Tower, Omaha, has awarded a $100,000 contract to Boyd Jones, 111 S. 40th St., Omaha, for construction of a fertilizer plant here.

RALSTON, NEBR.—Crown Products Co. has awarded a $90,000 contract for a plant addition to W. Boyd Jones Co., 111 N. 40th St., Omaha. Architect is M. J. Lahr, 34 Country Club Rd.

NEW YORK

EASTCHESTER, N. Y.—Gustave Robner, 112 W. 44th St., New York, will build a $100,000 plant for plastics materials on Marbledale Rd. here.

NIAGARA FALLS, N. Y.—Carborundum Co. plans to build a $127,000 shipping building.

MT. VERNON, N. Y.—Commercial Decal Co., 445 S. 10th Ave., plans to build a $750,000 factory. Architects are Prack & Prack, 119 Federal St., Pittsburgh.

SYRACUSE, N. Y.—Kilian Mfg. Corp., will build a $50,000 addition to its ball bearing manufacturing plant.

NORTH CAROLINA

CHARLOTTE, N. C.—Edgecombe Steel Co., Philadelphia, has awarded a $210,000 contract to Southeastern Construction Co. for a plant.

GASTONIA, N. C.—Beveridge Metal Products Inc. has been incorporated by Henry Beveridge and associates with a capital stock of $100,000.

KERNERSVILLE, N. C.—Allied Tool & Machine Co. has been incorporated by Carl Ballard and associates with a capital stock of $100,000.

MARSHVILLE, N. C.—Carolina Asbestos Co. has let a $97,500 contract to Interstate Construction Co., Charlotte, for a plant addition.

MOREHEAD CITY, N. C.—Ma-Dix Asphalt Shingle Co. Inc. has received low bid of $146,900 from V. P. Loftis, Charlotte, for construction of warehouse and factory building. Architect is A. R. Davis, 111 Corcoran St., Durham.

SPRUCE PINE, N. C.—Feldspar Milling Co. Inc. has OHE approval for a $200,000 plant.

OREGON

THE DALLES, OREG.—Interstate Tractor & Equipment Co., 2855 NW. Front Ave., Portland, has awarded a $67,000 contract to Midstate Construction Co., 810 Union St., for a 1-story shop.

PENNSYLVANIA

BRISTOL, PA.—Rohm & Haas Co., 222 W. Washington Sq., Philadelphia, plans to build a $100,000 manufacturing building. Architects are Fellheimer & Wagner, 155 E. 42nd St., New York.

MCDONALD, PA.—Disco Co., Oliver Bldg., Pittsburgh, has awarded a $3 million contract to Ferguson Edmundson Co., Keystone Bldg., Pittsburgh, for a coal conversion plant near here. Engineer is A.A. Archer, c/o owner.

PHILADELPHIA—Acme Mfg. Co., 7930 State St., has awarded separate contracts totaling $75,000 for a manufacturing building.

TENNESSEE

NASHVILLE, TENN.—Tennessee Products & Chemical Corp., c/o Carl McFarlin, president, 3948 Woodlawn Dr., will build a $150,000 fertilizer plant.

TEXAS

BEAUMONT, TEX.—Southern Acid & Sulphur Co., 7621 Wallsville Rd., Houston, will spend $170,000 for converting, remodeling and expanding its plant.

DALLAS, TEX.—Verson Mfg. Co., John Verson, president, Chicago, plans installation of a 1000-ton press in its newly completed plant on Holmes Rd.

DALLAS, TEX.—Texlite Inc., Harold H. Wineburgh, president, has let contracts totaling $91,680 to Austin Bros. and Mosher Steel Co. for structural steel, long span steel joists and o.t. joists in connection with construction of a plant. Architect is Grayson Gill, Great National Life Bldg.

GARLAND, TEX.—H. H. Hirsch, 3811 Wendlin St., Dallas, will build a $65,000 stove factory here.

HEARNE, TEX.—Texas Pipe Line Co., Texas Bldg., Houston, will build a $100,000 pumping station.

HOUSTON, TEX.—Ceco Steel Products Corp. has let a $100,000 contract to W. S. Bellows Construction Co., 716 N. Everton St., for construction of a 1-story shop.

HOUSTON, TEX.—Humble Oil & Refining Co., Humble Bldg., has let a $500,000 contract to H. K. Ferguson Co., M & M Bldg., for construction of a 1-story warehouse and office building. Architect is A. C. Finn, Bankers Mortgage Bldg.

HOUSTON, TEX.—Western Electric Co. Inc., Lockwood Dr. and Crite St., has awarded a $987,000 contract to Austin Co., Second National Bank Bldg., for a 2-story office and warehouse, assembly room, repair shop and loading facilities.

SAN ANTONIO, TEX.—San Antonio Transit Co., Transit Tower Bldg., will soon let contracts totaling $750,000 for maintenance shops and garage. Architects are Attlee B. and Robert M. Ayers, Transit Tower Bldg.

SMITHS BLUFF, TEX.—Pure Oil Co., Neil Esperson Bldg., Houston, will spend $365,000 in enlarging and improving its refinery plant here.

SUNRAY, TEX.—Shamrock Oil & Gas Co., Shamrock, plans to spend $450.000 in expanding and improving its gasoline refinery plant here.

WINNIE, TEX.—McCarthy Chemical Co., c/o Glenn H. McCarthy, Sterling Bldg., Houston, is completing plans for a second chemical plant here. Engineer and architect is Wyatt C. Hedrick, 5201 Fannin St., Houston.

YOUR SPECIFICATIONS

—from a simple pinion to helicals, worms and worm gears, bevels or spiral gears, will be met exactly.

"Industrial"

CUT GEARS
SPROCKETS • RACKS

Mass production of fine gears is an accomplishment that requires the best in manufacturing facilities and experience. With our Universal Equipment and skilled gear specialists, we can set up for any size job—any material including non-metallic.

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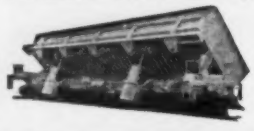

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25 Tons	8" Square	SAE 4120
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18 Tons	9¾" Fluted	SAE 1055
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13 Tons	10" Square Fluted	SAE 4820
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114 Tons	20" Square	SAE 4820
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75	Bars 2½ x 2 x 5/16 Angle 40'	13500
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8	Bars 3 x 2 x ½ Angle 40'	2464
64	Bars 3 x 2 x ½ Angle 60'	29568
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1 " 3 x 3 x 5/16"	1 " 3 x 4 x ¼"
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¼ " 4 x 4 x ⅜"	½ " 5 x 5 x 5/16"
¼ " 5 x 5 x ⅜"	

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To take full charge of maintenance and construction in a sheet mill plant located in Southern Ohio, consisting of 13 sheet mills, 13 Wilson annealing furnaces, 7 galvanizing pots, various electrical drives, boiler house and steam distribution, auxiliary machines, blacksmith, welding, pipe fitting and electrical repair shops. Give full details regarding your experience, age, etc., and salary expected in your written reply. Write Box 123, STEEL, Penton Bldg., Cleveland 13, O.

INDUSTRIAL ENGINEER

Steel Foundry in New England has opening for Industrial Engineer with experience in establishing wage incentive plan in all departments. Preliminary work required in obtaining proper work flow, motion analysis, etc. Excellent opportunity for permanent position and advancement. In replying give all details of experience, salary desired, etc. All replies kept confidential. Write Box 125, STEEL, Penton Bldg., Cleveland 13, O.

ASSISTANT SUPERINTENDENT FOR MEDIUM sized Drop Forging Shop in the East. Must have practical Forge Shop Experience, able to get out volume and quality production. Must know something about die making. Prefer technically trained young man in late thirties. Excellent opportunity. Give full experience particulars, personal information, salary expected, etc. in first letter. Replies will be kept confidential. Write Box 115, STEEL, Penton Bldg., Cleveland 13, Ohio.

PLATE SHOP GENERAL MANAGER TO OPEN idle plant and have charge of entire operation, including procurement, production, and sales. Prefer man between 40 and 45. Must have thorough background in plate work. Will consider salary and share of profits. Location near Huntington, W. Va. Write Box 122, STEEL, Penton Bldg., Cleveland 13, O.

WANTED: SALES MANAGER FOR TOOL Steel Division with experience and following, particularly Eastern Seaboard territory. Good opportunity energetic and ambitious man. Apply Hoyland Steel Company, Inc., 4714 Chrysler Bldg., New York 17, N. Y.

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Over 250,000 square feet; high ceilings; on two railroads; excellent condition. Good labor conditions. Suitable for any type of heavy manufacturing.
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SALES REPRESENTATION WANTED

Sales agents or manufacturers' representatives needed by large manufacturer of seamless and welded specialty tubing in carbon steel, alloy, and stainless grades in following cities:

St. Paul, Minn.
Minneapolis, Minn.
Denver, Colo.
Salt Lake City, Utah

Applicants must have steel commodity sales experience preferably on tubing and/or on alloys and stainless, and must be presently located in one of the cities in question. Representation is needed for each of the cities mentioned separately, and applications will be treated in confidence.

Write Box 132
STEEL, Penton Bldg., Cleveland 13, O.

Help Wanted

WANTED: CHIEF TOOL AND DIE ENGIneer. Manufacturer of bus bodies and custom auto bodies. Employing approximately 1100 people requires the services of a qualified tool and die engineer to take complete charge of tool and die engineering and construction of same. Must be experienced in passenger car or bus body tooling, also, experience helpful in tooling for plane manufacture. This is a permanent position with a reliable old company. Future for man with proper experience and who can accept responsibility, supervise personnel, and carry complete tooling program. State past ten years of employment giving names of such employers and salary desired. All communications will be held confidential. Address Box 124, STEEL, Penton Bldg., Cleveland 13, O.

PERMANENT POSITION FOR GRADUATE Engineer. Structural Steel and Light Iron Estimator. Some structural design experience desirable. Plant in Eastern Pennsylvania. Write Box 120, STEEL, Penton Bldg., Cleveland 13, O.

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SALARIED PERSONNEL $3,000 — $25,000. This reliable service, established 1927, conducts confidential negotiations for high grade men who seek a change of connection under conditions assuring, if employed, full protection to present position. Send name and address only for details. Personal consultation invited. JIRA THAYER JENNINGS, Dept. S, 109 Church St., New Haven, Conn.

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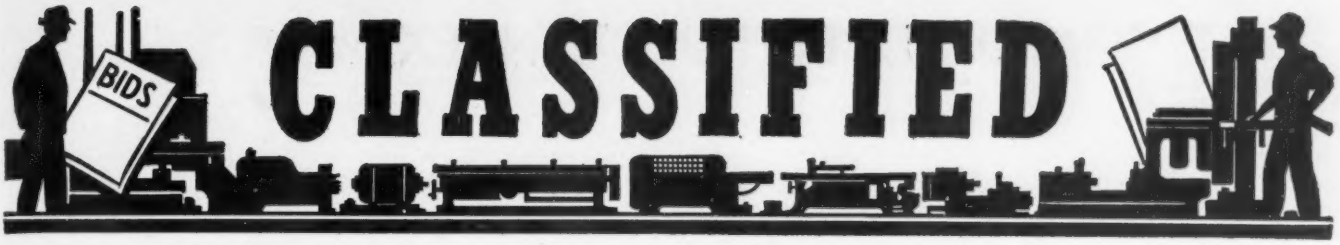
MANUFACTURING ENGINEER
Mechanical engineering graduate, 35 years old with twelve years of diversified experience in production and industrial engineering. Experience includes responsible positions in machine tool, glass, aircraft and metalworking industries. Details and references supplied on request. Opportunity rather than exceptional salary paramount. Write Box 127, STEEL, Penton Bldg., Cleveland 13, O.

YOUNG EXECUTIVE QUALIFIED BY SIXteen years work with outstanding manufacturers in administration, production, purchasing, supervision, and timestudy. Some merchandising, sales and traveling experience. Good general knowledge of manufacturing processes, machinery, materials, and tools. Correspondence conductive to permanent improved opportunity invited. Age 37. Write Box 962, STEEL, Penton Bldg., Cleveland 13, O.

FOREMAN AND STAFF SPECIALIST, 16 years manufacturing experience invites correspondence. Want work in dry climate, prefer small community. Age 37. Write Box 950, STEEL, Penton Bldg., Cleveland 13, O.



Opportunities | Opportunities | Opportunities

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FOR SALE

OVER $1,000,000 PROFIT before income taxes, during last 5 years. Business has made money continuously since established in 1889.

LOCATED in one of industrial bright-spot western cities. 500,000 population in the heart of a vast trade area.

STRUCTURAL PLANT, office building, welding shop, ornamental iron shop, and steel warehouse erected in 1926 and 1942. They cover only 20% of the 8 acres.

PLANT CAPACITY 500 tons of fabricated steel per month. Plant and equipment are modern and are operating on sizeable backlog of unfilled orders. Plain steel material sales from warehouse average 200 to 300 tons per month. Potentials in the market area, availability of fabrication-in-transit freight rates, and space for plant expansion should permit 4-fold increase in business.

PERSONNEL During past 58 years, there has never been a strike. Closed shop agreement. Superintendent, shop foreman, chief engineer, chief estimator, and other key personnel have been with company from 20 to 35 years.

REASON FOR SELLING The surviving active member of founder's family had an operation May 16, 1947, for cataract on one eye which now has zero vision, and must undergo an operation on the other eye, which now has only 50% vision. Failing eyesight presents many difficulties for him to continue efficient management of the business.

PRICE $1,000,000 for the business, including real estate, equipment, inventory, unfilled orders, goodwill, and other assets shown on balance sheet, except it does not include quick assets (cash, bonds, etc.) or accounts receivable. Company's books and records will be made available to anyone who has inspected the plant and is genuinely interested in purchase of the business.

INQUIRIES CONFIDENTIAL Because the business is now a highly successful and going concern and leads competition in its field, and because of the present associations of some steel men who may be logical prospects, it is mutually advantageous that all inquiries be treated by gentlemen's agreement as strictly confidential.

For further information, write Box 121,

STEEL • PENTON BUILDING • CLEVELAND 13, OHIO

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FLAME CUTTING
WELDED STEEL FABRICATION
Machine frames and bases, gears, flywheels, pulleys, special shapes.
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Send prints for quotation.
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QUOTATIONS PROMPTLY FURNISHED
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Metal Specialties comprised of STAMPINGS, FORMING, WELDING, SPINNING, MACHINING. All Metal or Combined with Non-Metal Materials
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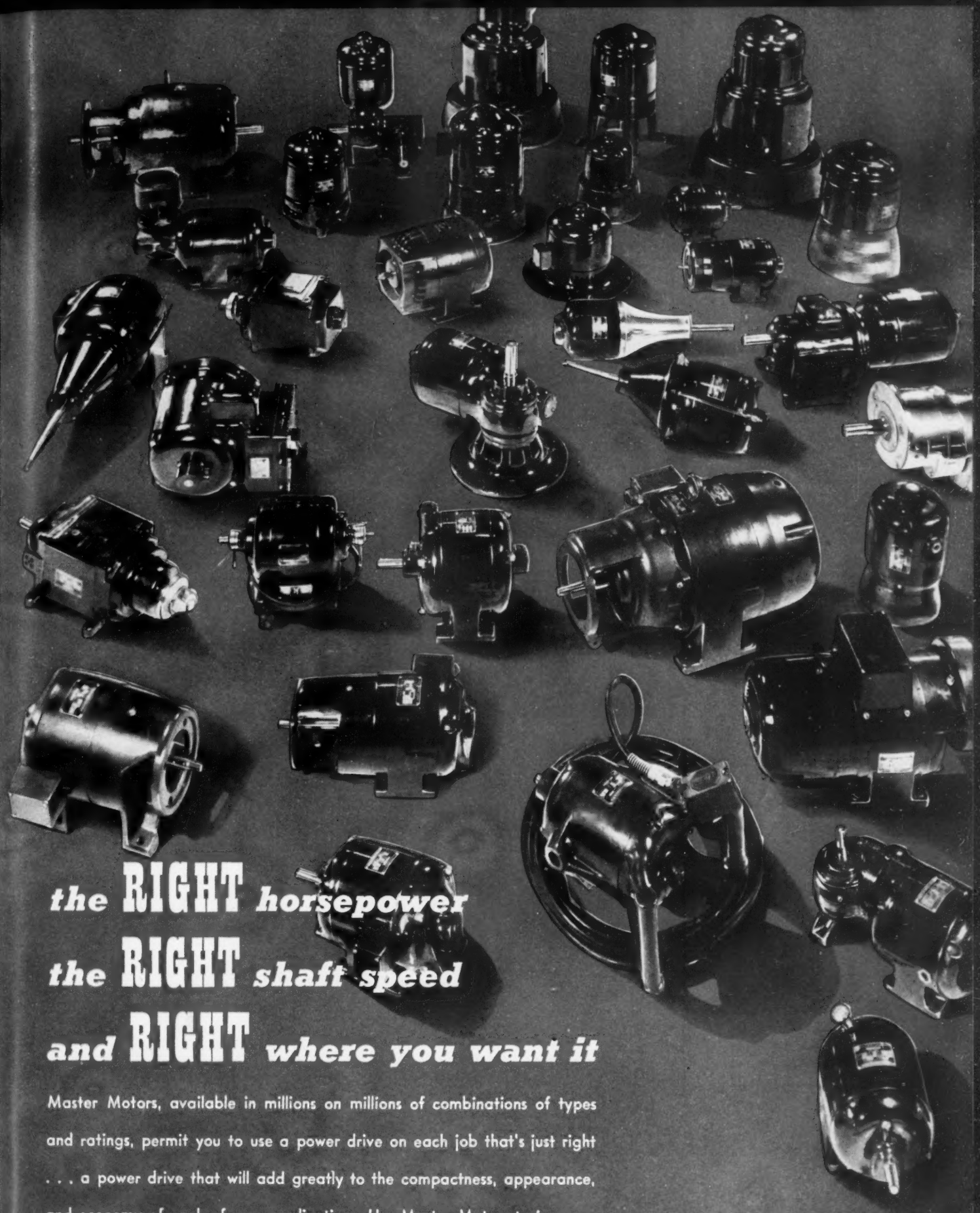
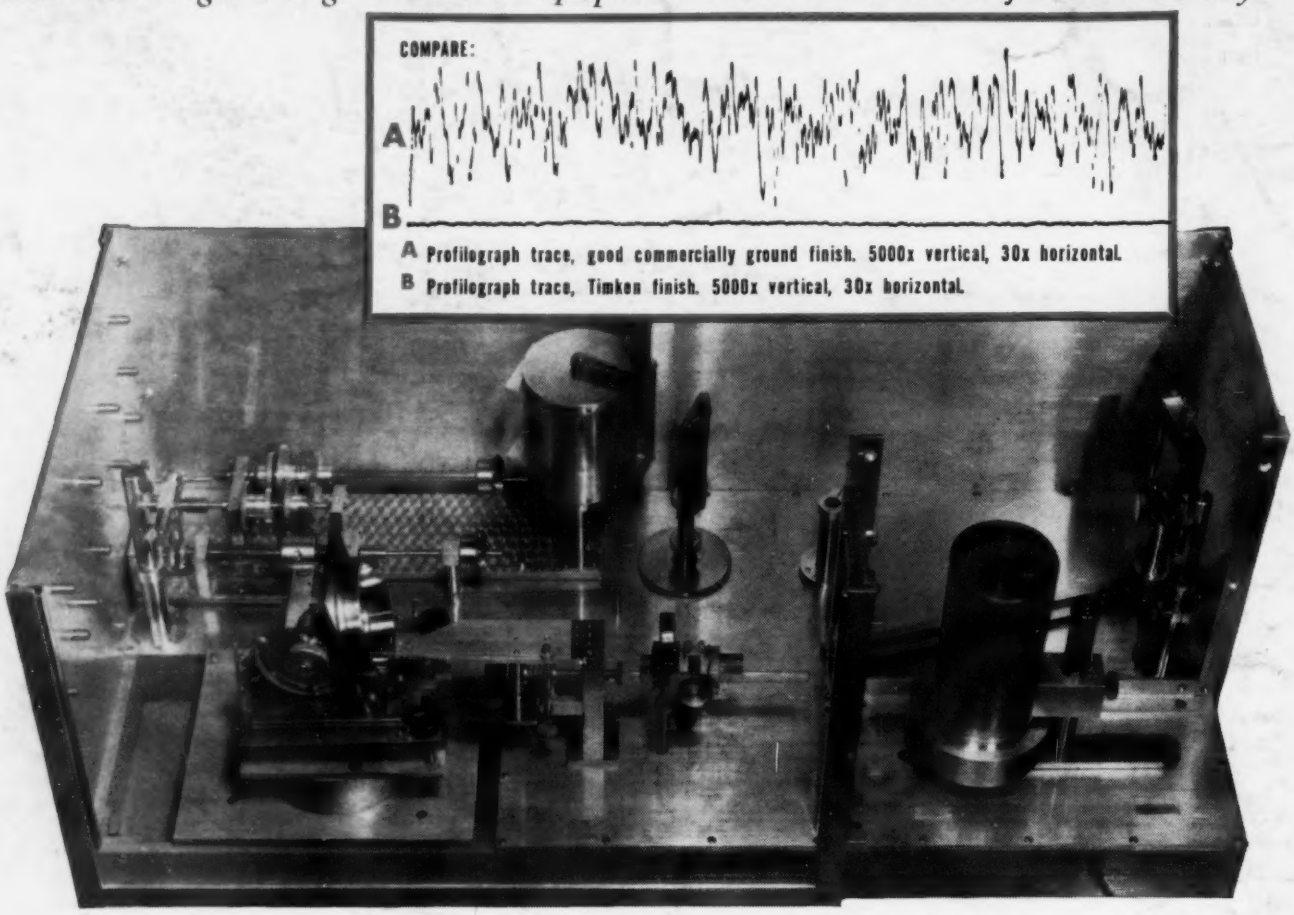


the RIGHT *horsepower*
the RIGHT *shaft speed*
and RIGHT *where you want it*

Master Motors, available in millions on millions of combinations of types and ratings, permit you to use a power drive on each job that's just right . . . a power drive that will add greatly to the compactness, appearance, and economy of each of your applications. Use Master Motors to increase the salability of your motor-driven products . . . improve the economy, safety, and productivity of your plant equipment.

THE MASTER ELECTRIC COMPANY • DAYTON 1, OHIO

Timken bearings make good steel mill equipment better . . . here's one of the reasons why:


COMPARE:
A
B
A Profilograph trace, good commercially ground finish. 5000x vertical, 30x horizontal.
B Profilograph trace, Timken finish. 5000x vertical, 30x horizontal.

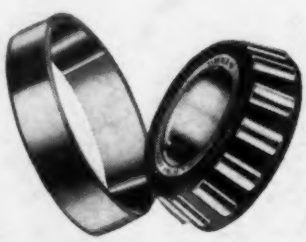
Answers the question— "How rough is smooth?"

ONE of the reasons Timken tapered roller bearings perform with such frictionless, wear-free ease is the amazingly smooth surface finish on the rolls and races —the finest known to modern bearing science.

Now, when you talk about finishes like this, you're talking about surface irregularities of only a few millionths of an inch—irregularities which are impossible to detect by any ordinary means. So, when Timken first began to develop this finish, one of the biggest obstacles was the absence of an accurate method of measuring the roughness of an apparently smooth surface.

The profilograph pictured above was the answer. Developed by Timken in 1928 and steadily improved since then, the profilograph determines surface irregularities to within one-millionth of an inch. Equipped with this measuring stick, Timken engineers were able to develop new finishing methods and machines, which have resulted in the microscopic surface accuracy of the Timken bearings you use today.

Every factor in the efficiency of a bearing is approached at Timken in this same scientific manner. For example, Timken makes its own steel to assure constant quality. And Timken is the acknowledged leader in: 1. advanced design; 2. precision manufacture; 3. rigid quality control; 4. special analysis steels. No wonder you can always be sure of uniformly top quality and performance in the Timken bearings you use. The Timken Roller Bearing Company, Canton 6, Ohio.



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